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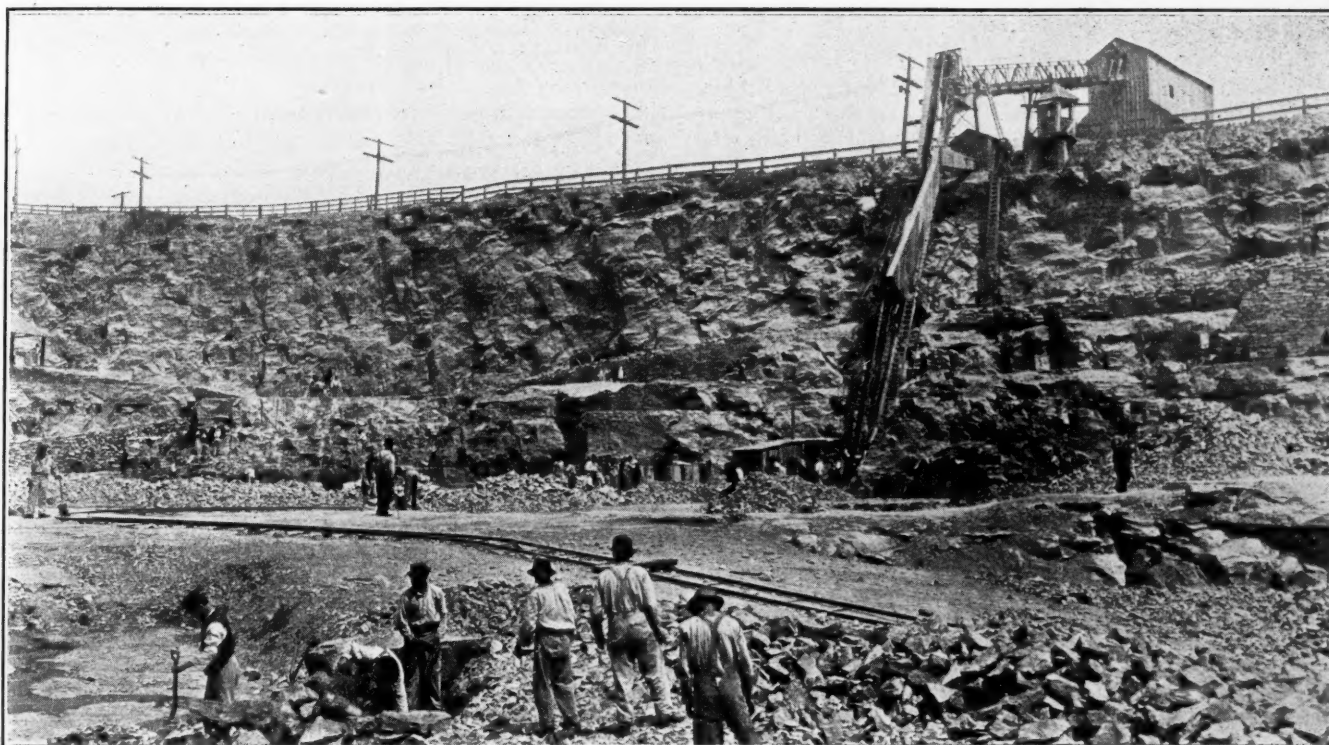


FIG. 2.—STONE MOVED BY HAND CARS AND ELEVATED TO CRUSHER BY BUCKET CONVEYOR.

QUARRYING WITH PRISONERS IN ST. LOUIS

Broken Stone for Street Department Furnished by Workhouse Prisoners at Municipal Quarry—Effort Secure Efficient Work from Defectives by Improvements in Equipment—Daily Stints for Hand Drilling.

By HARRY M. CRUTCHER.*

The problem of furnishing proper employment for the human derelicts constituting the greater part of the population of a city's penal institutions is one which confronts practically all American municipalities. The average inmate of the workhouse is not efficient in any branch of work. If he were, he probably would not be there. The prisoners are not of the wage earning type and are, as a rule, defective mentally, physically, or both.

While not claiming to have solved the convict labor problem, the city of St. Louis operates a system whereby the workhouse prisoners are kept busily employed and the municipality receives a substantial return from their labor. The prisoners are required to labor in the municipal rock quarry which adjoins the workhouse grounds in the southern part of the city. The quarrying of rock by prisoners is nothing new, but the methods employed in St. Louis in "working" the quarry will doubtless be of interest.

Steps are rapidly being taken to install modern equip-

ment in the quarry so that a much greater percentage of efficiency can be obtained. The street department can use all of the quarry's output of macadam in the reconstruction of the city streets. Of course, owing to the class of labor employed in the work, the highest standard of efficiency will never be reached. However, if, after the installation of time saving apparatus, all of the prisoners are kept busily employed throughout the working period, the desired result will be obtained.

During the year ending April 1, 1914, the street department received from the quarry a total of 202 carloads and 8,269 wagon loads of macadam. Small amounts of crushed rock were furnished from time to time to the park and fire departments also.

The quarry is located between the workhouse and the Mississippi river, the bed of the quarry being about five feet below the bed of the river. So far no water has found its way into the quarry on the river side, although seepage is noticeable from other directions. On the narrow strip of land between the top of the quarry and the

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river is a road and the tracks of the Missouri Pacific Railway, including a sidetrack for the loading of cars with macadam from the quarry.

Formerly the rock was broken into spawls by hand and transported in mule carts up a steep incline (Figure No. 1) to the road at the top of the quarry and thence to the crushers. After being crushed, the rock was transported to the various street department districts. A few years ago a No. 4 Austin crusher was installed at the eastern edge of the quarry floor, and so arranged as to feed a bucket conveyor system which carries the crushed rock to the top of the quarry wall and thence over the road and railroad tracks into the screen and bin house (Figure 2).

The crushed rock passes through a rotary screen which separates the different sized rock, throwing into bins. The latter are provided with chutes for the loading of wagons and railroad cars. The screen and bin house is equipped with a No. 7½ Austin crusher, but this is not in use at present.

The floor of the quarry is covered with a network of portable track used to facilitate the carrying of rock to the crusher. Ten steel push cars are operated on these tracks, five at either end of the quarry. White prisoners lift the spawls into these push cars. Owing to the steep grades in the quarry the cars are filled only about one-third full and then pushed by five men up-grade to the crusher. Plans are under way for the installation of a motor-driven cable system which will be used to pull the cars from the rock piles to the crusher.

The hand drilling is done by the negro prisoners, who also do most of the sledging. Those assigned to the hand drills are allowed to quit work for the day when they have drilled a stipulated number of feet. Some of the negroes, eager to complete their tasks, labor earnestly during the early part of the day and finish long

before the quarry closes. There are three steam drills, two being in use constantly. They are operated by white prisoners.

The street department recently delegated F. N. Simmons, an expert quarry man, to take charge of the work. The blasting is attended to by Mr. Simmons personally while the prisoners are at dinner, a precaution against needless accidents.

The following is an estimated valuation of the present quarry equipment:

One No 7½ Austin Crusher.....	\$2,500.00
One No. 4 Austin Crusher.....	1,000.00
One 54x18-in. Return Tubular Boiler.....	1,500.00
One Portable Locomotive Boiler.....	500.00
One Upright Derrick Boiler.....	350.00
One Derrick and Hoist.....	1,500.00
One Steam Sump Pump.....	250.00
One Elevator and Conveyor System.....	3,600.00
One Rotary Screen.....	150.00
One Screen and Bin House.....	1,500.00
Three Steam Drills.....	500.00
Two Single Switches.....	50.00
Two Turntables.....	65.00
1,800 Feet Portable Track.....	825.00
One Three-way Switch.....	45.00
Ten Push Cars.....	500.00
One Motor-driven Pump for Crusher Pit.....	350.00
Structures: Boiler House, Guard Houses, Office	
Powder Magazines, etc., about.....	1,000.00
Miscellaneous Hand Tools.....	500.00

Total.....\$16,685.00

Inasmuch as the blacksmith shop equipment is used almost wholly in the repair of quarry tools, etc., it should properly be charged to quarry equipment. A large portion of the power plant equipment should also be charged to the quarry, as light and power current is furnished from the plant. A further charge of \$5,000 probably will cover both of these items.

The city charter grants no authority to let the pris-

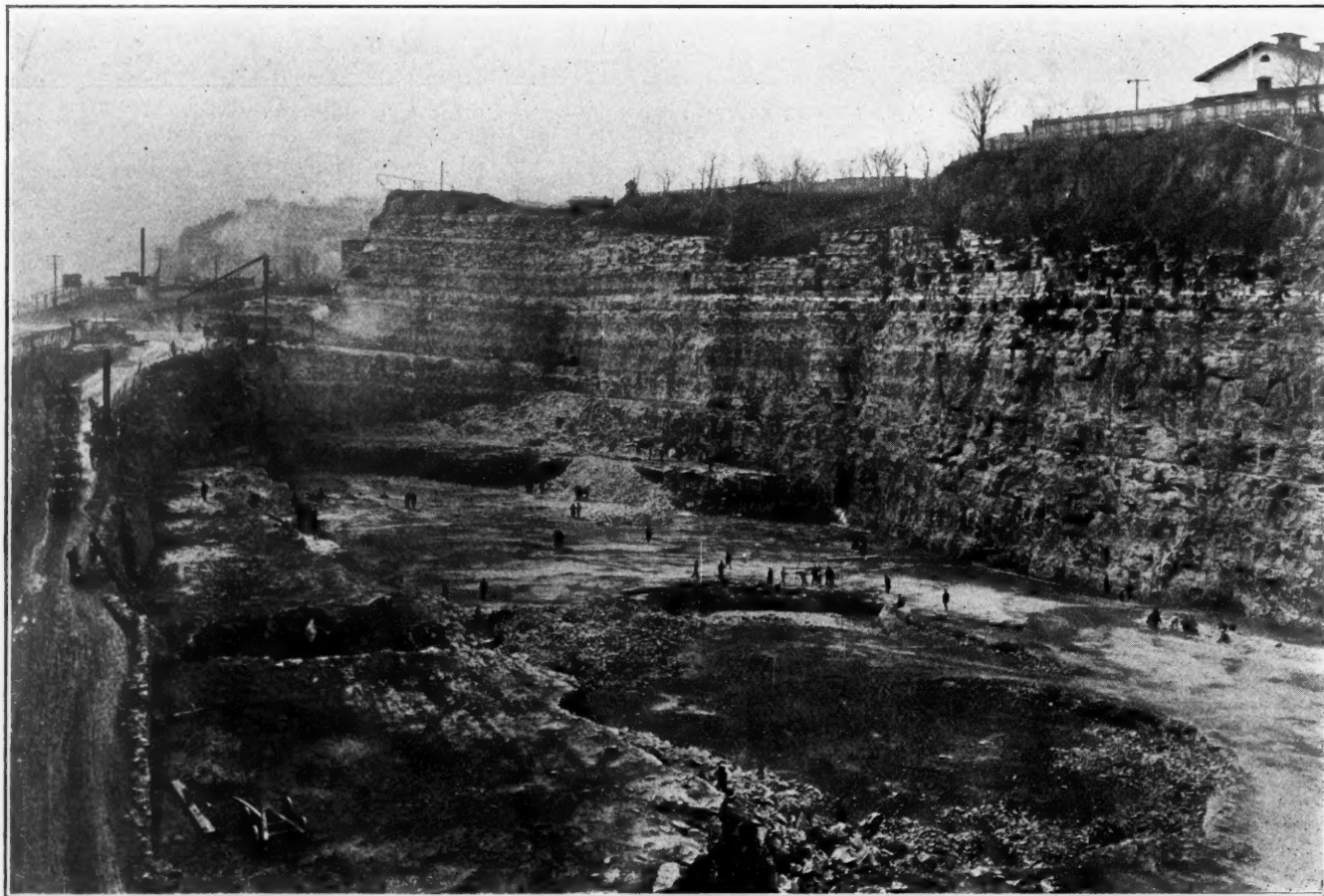


FIG. 1.—MUNICIPAL QUARRY. STONE REMOVED BY CARTS OVER ROAD AT LEFT.

oners by contract to private parties. The ordinances provide that the superintendent shall keep all prisoners committed to the workhouse employed "at such useful and profitable labor as their health and strength will permit." The eight-hour day is established by ordinance.

The workhouse is at present governed by Capt. Frank J. Primavesi, a man of military experience.

SAND CLAY ROADS*

Conclusions from an Examination of Twenty-five Hundred Miles of Such Roads in Georgia—Selecting Materials—Methods of Construction.

For two years John C. Koch has been investigating the subject of sand-clay roads in Georgia, during this time having traveled over about 2,500 miles of such roads in various parts of the state, examining those which had been in service from one to five years, some of which had worn well and some had not given entire satisfaction on account of dust and mud. He obtained all the definite information possible concerning the materials used, methods of construction and behavior of each of these roads in all seasons of the year, and took samples, generally from wheel tracks, for examination. More than 900 samples were taken, representing 48 counties, and comprising every typical sand-clay section of the state. These samples were chopped out with a hatchet and were usually 5x5x4 inches deep. Samples so obtained, as well as those of available deposits, were examined in the laboratory of the University of Georgia; in fact, the investigation was made under the auspices of the good roads department of the University, which is carrying out a policy of university extension work, offering free engineering assistance to the road officials of the state on highway and bridge work.

Mr. Koch briefly stated the advantages of sand-clay mixtures to be as follows: 1. Low first cost; 2, low maintenance; 3, no expensive machinery for construction or repairs; 4, no skilled labor required.

He divides sand-clay roads into two classes, those made of top soil or natural mixtures, and those made by artificial mixing of clay and sand deposits. The advantages of the former are that the expense of mixing is eliminated, that the road becomes compacted more quickly, and that repairs are more easily made and the new material unites more quickly with the old.

There are many miles of sand-clay roads in Georgia which have cost less than \$500 per mile for the surfacing in place. They carry heavy country traffic, and the repairs during a period of five years have not averaged \$5 per mile per year. Considering the fact that the first cost of construction of such surface is less than the annual interest and maintenance charges on almost any other type which has been offered as an improvement on the earth road, it seems inevitable that wherever sand-clay materials are available and of suitable quality it is the best type to use for the average country road.

In discussing this paper, E. W. James stated that the author had made his investigations on the one point of North America most favorable to sand-clay roads, in that here the best materials are found for the purpose. "It is safe to state," said he, "that sand-clay roads can be built in few sections of the United States in such a way as to give as great a degree of service as in Clarke or Elbert counties, Georgia. For several years the writer has had a wide experience in sand-clay work throughout

all the coastal plain from Virginia to southern Texas, and recognizes the importance of this type of construction. For a large section of the southeastern states it is the only possible type of improved road for a large mileage of the country highways."

The gravel roads constructed of cementitious gravel found along the Hudson River (see Municipal Journal for February 27, 1913) were referred to by Spencer J. Stewart, engineer in the New York state highway department, as being allied to sand-clay roads, in that clay was used as a binder. In this connection he called attention to the fact that the specifications of New York and other state highway departments have insisted that the foundation courses for macadam and other roads be filled with screenings, gravel or sand, and invariably rule against clay filler; but Mr. Stewart, judging from results obtained on more than 300 miles of highways of which he had had responsible charge, has been led to believe that clay-bearing materials, if applied as a filler when dry, make a foundation as suitable as, and less likely to disintegrate than a filler of sand or screenings of a non-cementitious stone.

Professor A. H. Blanchard regretted that so little information was given with reference to local conditions, saying: "As the fundamental principle of sound practice is to use that type of road or pavement which is economical or suitable for a given set of conditions, it would be of great value to American engineers to have at hand especially more detailed knowledge relative to the traffic on the various types of roads referred to in the paper." Attention might be called at this point to the statement of Mr. Koch that where the roads are crowned too much objectionable shallow gulleys are washed transversely off the road by rains, for which it would seem natural to infer that a road of this kind was not suitable for any considerable grade which would cause even a small flow of water to follow the ruts in the road.

SELECTING THE MATERIALS.

Concerning the materials entering into the road, the author of the paper found in his experience that the sedimentary clays are finer grained and more plastic than the residual, and that the latter make a harder and tougher mixture for road work when combined with sand. The important characteristics of the clay for such roads are plasticity, shrinkage and slaking. The plasticity is indicated by the ease with which a clay, when wet to a certain extent, can be moulded into various shapes which will be retained after the material has dried. The most plastic clays resist water for a long time, but others often crumble to pieces like quicklime. It is evident that slaking clay would tend to break down rapidly into mud when exposed to rain and the puddling effect of traffic.

Silt mixed with clay to the extent of 3 to 8 per cent. seems to improve the road, probably by retaining a certain quantity of moisture beneath the surface. In a few cases the author found silt and organic matter together in quantities as great as 20 per cent. of the total sand-clay mixture, and yet the road was giving good service.

In examining the samples collected he separated the sand and clay, first by screening through a No. 10 sieve and then by washing the clay from the sand. The sand was then passed through sieves of 20, 40, 60, 80 and 100 meshes to the inch, and the proportion of each size determined. Two steel moulds, brass-lined, one inch internal diameter and 4 inches long, together with a close fitting plunger and a wooden mallet, were used in making test cylinders, which were compacted by the plunger and mallet. Such a cylinder was made of the soil after passing it through a No. 10 sieve and wetting it to a stiff

*Abstract of paper by John C. Koch and discussion before the American Society of Civil Engineers.

paste, and another was made of the clay which had been removed by washing. Each of these cylinders was dried in air at 100 degrees Centigrade, and when entirely cool was immersed completely in a glass jar of water at a temperature of 21 degrees Centigrade, and the time noted in which it disintegrated until the material had assumed its natural slope of repose. The material was also tested for the amount of mica and feldspar which it contained. His calculations were that the sand-clay mixture which gave good service would disintegrate in this test at from 2 minutes to nearly 60 minutes, the time usually being from 5 to 20 minutes; and that the cylinder of clay which has proved satisfactory disintegrates in from 2 to 20 minutes, the average time being from 2 to 4.

Mr. James, in his discussion, recommended field testing of materials as follows:

Typical samples are taken of both sand and clay. Mixtures are made, ranging from 1 part sand to 3 parts clay, up to 3 parts sand to 1 part clay, or sometimes beyond these limits, if the materials appear to warrant it. These mixtures should be made to vary by one-half of 1 part, 1:3, 1:2½, 1:2, etc., 1½:1, 2:1, 2½:1, etc., and should be worked up with water into putty-like masses.

From each test, mix a small sample of from 1 to 2 cu. in., cut out with a small measure. The writer has found a small medicine glass, or even a large brass thimble, handy. It is only essential to get equal samples from each test mix. These samples are then rolled between the palms of the hands into reasonably true spheres and placed in the sun to dry. Some designating marks may be scratched on them. When thoroughly baked, they are placed in a circle in a flat pan or dish, and enough water is poured in the pan to cover them, care being taken not to pour the water on the samples.

Slaking will begin at once. The lapse of time found by Mr. Koch with his compressed specimens is not found at this stage. The slaking, however, will proceed at different rates. The sandy specimens will break down first, those with excessive clay will disintegrate second in order, and those having about the proper proportions will act more slowly. Usually, there will be one or two that determine the proper proportions of the materials, and, in the writer's experience, these will usually lie together in the series of test mixtures.

A supplementary test of some value can also be made on the dry spheres. Lightly rubbed with the thumb, those having too much sand will break down rapidly. Those having too much clay will soon begin to "dust" away, while those having the most stable mixtures will assume a slightly glazed effect under the light rubbing, due to the moisture and oil of the skin. These two tests will not give the same results. The dry test will indicate a mixture richer in clay as the better one, and the wet test will indicate a sandier mixture. The sample indicated as satisfactory under the wet test that lies between the other two will prove best in service.

A number of typical samples were described by the author, and the histories of the roads from which they were taken were given. Perhaps the best of these was one in Clarke County, which had been in use for four years, with only the very lightest repairs and an average cost of maintenance of less than \$5 per mile. There was very little dust on it, and the surface was firm and hard throughout the year, though freezing and thawing at times softened the crust for a depth of an inch or so. It was impossible to reshape the surface with a road machine on account of the hardness of the compacted material. This road was built of a natural mixture found as top soil of cultivated fields. This road runs between Athens and Danielsville. It contains 69.3 per cent of sand and 30.7 per cent. of clay, 6.3 per cent being coarser than one-tenth of an inch.

In Richmond County is found a material which is shipped by rail for road construction for distances as great as 100 miles. The most significant part of this

material is that it contains 34 per cent of material coarser than one-tenth of an inch, and is really a low grade gravel rather than a true sand-clay mixture. It contained little sand which passed through a No. 60 sieve, and clay constituted 48½ per cent of the mixture.

From his studies Mr. Koch reached the following conclusions:

(1) The total relative sand content, disregarding the size of the sand grains, is no criterion of the value of the material.

(2) The sand smaller than No. 60 is of little value in the mixture, that smaller than No. 100, except in very small quantities, is detrimental.

(3) The greater the proportion of coarse to fine sand the harder and more durable will the road surface be.

(4) For the best possible results with sand-clay mixtures the sand smaller than No. 10 and larger than No. 60 should not be less than 45% nor more than 60%, by dry weight, of the entire sample. In addition, the sand smaller than No. 10 and larger than No. 60 should be composed of about equal parts of Nos. 20, 40 and 60. The total sand content should in no case exceed 70% by weight of the total sample.

(5) Test cylinders of the sand-clay mixture, 1 in. in diameter and 3 in. long, should, when thoroughly dried in air bath at 100° C, take at least 2 min., when immersed in water at 21° C, to crumble down to the natural slope of the material, and preferably should take 6 min. If the cylinder fails in this test it should be regarded with suspicion. If the sand analysis is poor and the cylinder test is also poor the material is not worth using.

(6) Test cylinders, made from the clay removed from the sample, 1 in. in diameter and 3 in. long, should take at least 2 min. to crumble down to the natural slope of the material when immersed in water at 21° C. If it fails in this test, but passes the test of the preceding paragraph, it may be used, but it indicates a poor quality of binder.

The material comprising the top soil of cultivated land, when composed of the proper combination of sand and clay, has probably been more thoroughly weathered and therefore is less likely to wash and disintegrate when placed on the road. Cultivation has also produced a more thorough and complete mixture of the two materials.

METHOD OF CONSTRUCTION.

Mr. Koch recommends the following method of construction:

The sub-grade of the roadway is brought to a level or slightly convex cross-section. The sand-clay is then placed in a continuous layer, from 10 to 12 in. thick, the material being spread as fast as delivered and not dumped in piles here and there. This layer is spread for a width of 20 ft. for a nominal 30 ft. roadway. After a sufficient quantity has been placed in this manner, an ordinary road machine is drawn along the ditch line, cutting about 4 in. deep at the outside, and the blade is set so as to cast the material from the ditch against the edge of the sand-clay layer. In this way a shoulder is built up against the sand-clay to hold it in place. This also shapes the ditch. After both sides have been thus shaped the road machine, in successive passages, rounds up the cross-section of the sand-clay so as to give proper crown to the roadway and a smooth line from the crown to the ditches. As soon as the road is shaped, traffic and the construction teams begin to compact it, and it rapidly becomes consolidated without the use of a road roller. As the consolidation progresses ruts are formed, and they should be filled and a proper cross-section maintained by the occasional use of the road machine for a period of about 2 months. Unless this is done the road surface will become rutted and rough, and eventually compacted with a concave crown which will prevent proper drainage. After the material has been consolidated into a hard mass the difficulty of securing a good cross-section is largely increased.

The cross-section which seems to have given the most generally satisfactory results is a parabolic form with a crown of ½ in. per ft., that is, for a roadway surfaced for a width of 20 ft. the crown would be 5 in., and the height of the center of the road above the ditch (for a road having a width of 30 ft. between ditches) would be 7.5 in. With steeper crowns than this it has been found that the surface cuts into a series of parallel ridges running from the wheel

tracks to the ditches and making it very disagreeable for travel. If less crown is given the provision for wear is too small, and the drainage may not prove satisfactory after a comparatively short time.

For several months rains are apt to soften the top crust and cut up the smooth surface, but if patience is exercised and the road machine is used to maintain the cross-section properly it will be found that the puddling action of the traffic when the road softens is a great aid to final consolidation.

Construction with Artificial Mixtures.—From analyses made of materials proposed for use on account of accessibility, and from a study of their sand analyses, the proper ratio in which two or more materials should be mixed can be determined so as to secure the best possible results with the available materials. Three cases arise in which artificial mixtures are to be used:

(1) Sand foundation, where clay is to be hauled and proper mixture made by disk plowing and puddling.

(2) Clay foundation, where sand is to be hauled and mixture made as above.

(3) Soil foundation, where both sand and clay are to be hauled and mixture made.

In any of these three cases the proper mixture of the materials and the puddling action of traffic are necessary to secure a good consolidation. It takes considerable labor to secure a satisfactory mixture, but, except for this, there is no essential difference in the fundamental principles applying to construction with either artificial or natural sand-clay mixtures. The use of the road machine to maintain the cross-section and the height of the crown should be the same for each type of construction. For the softer varieties of sand-clay the split-log and other forms of light drags may be used effectively in maintenance.

CONVICT LABOR IN NEW JERSEY.

New Jersey's pioneer convict labor camp for road work was established in North Jersey last summer, and operated successfully with thirty men and had equipment for ten more when they might be furnished by the prison authorities. This was the first instance in that state where convicts had been kept out of the prison over night.

While the establishment of the camp, purchase of all the necessary furnishings and machinery and the laying and superintendence of the work has been taken care of by the Department of Public Roads, representatives from the prison see to the proper conduct of the men. Five guards are furnished for this purpose, but these are too many if the honor system is to be adopted, and too few if they are to be held under actual guard, in the opinion of E. M. Vail, division engineer of the northern road division.

The Department of Public Roads must feed and house the prisoners, direct their work and pay for their guarding, though the guards are not under the control of the department.

"It was originally supposed that the men would be paid for the work. This," says Commissioner Stevens, "has not been done on account of a defect in the statute. In spite of this the men have worked well. There can be no question of the success of the experiment as far as the physical and moral welfare of the prisoners is concerned. Under conditions heretofore existing there has been no economy in their work. The expense for guards is considerable. The large expense for machinery and tools, for starting the camp, providing water, etc., have all had to be paid and charged to the work. These expenses are heavy. They represent an investment in plant that will not have to be repeated. The clerical force at the disposal of the department has not been sufficient to keep the detailed accounts necessary to show the costs properly chargeable to the units of actual work done. It is felt that if the work is to be fully successful, it must show at least no greater expense

than work done by contract. That this result can be obtained under proper conditions seems, to this department, beyond reasonable doubt; in fact it is the judgment of every one at all familiar with road work and with the work of the road gangs that these men are the best labor now available.

"I may add that the hours of labor are strictly limited to eight per day. The labor performed by the men, their snap and spirit are the best argument for such a limitation."

RENEWING ASPHALT TOP SURFACE.

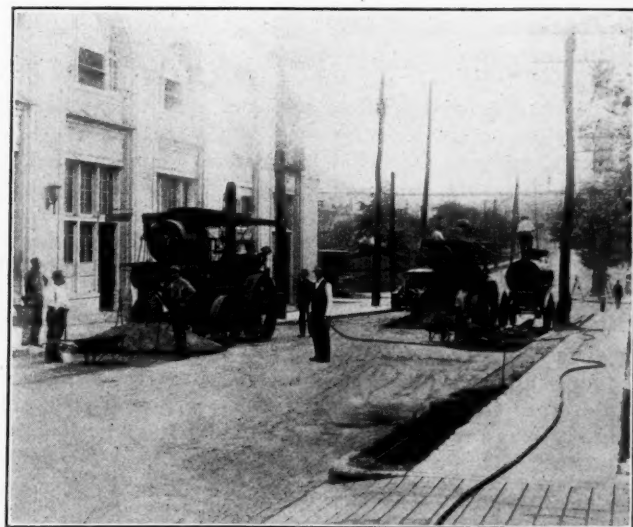
Pittsburg, Pa., has been operating for a number of years a municipal asphalt plant, which was described in our issue of September 2, 1908. The season of 1913 found the city with a large number of streets that required resurfacing. To remove the surface and lay new binder and top would probably have cost between \$1 and \$1.20 per square yard. Removal of the top by surface heater was suggested as an alternative that promised considerable economy. For instance, Super-



RESURFACING IN SAN FRANCISCO.

intendent D. J. McCoy, of San Francisco, reported that in resurfacing Market street the items of cost were as follows:

Labor and teams.....	\$355.50
41½ loads of asphalt, at \$10.28.....	426.62
Fuel and lubricating oils.....	13.00
Repairing machine	2.00
Total.....	\$797.12



SURFACE HEATERS WORKING IN PITTSBURGH.

Which gives an average for the 2,640 square yards covered of 30 cents per square yard.

Arrangements were made with the Equitable Asphalt Maintenance Company for the use of four Lutz machines on a rental basis, by which about 100,000 square yards were resurfaced. The cost of this work averaged about 60 cents a square yard, but this high cost was largely due to the fact that it included removing and replacing a full 1½-inch layer of asphalt, and that San Francisco obtained its asphalt at a much lower price.

The machines removed about 500 square yards of material per day, a low average, because the top was removed down to the binder in most instances. It burned about 210 gallons of fuel oil per day, and required the services of an engineer, a water man and two laborers scraping away the surface. After the surface material had been softened and scraped off it was replaced with a new surface, laid in the usual way.

ADDITIONAL HIGHWAY DATA

Roads in Ohio and New Mexico, and Sums Spent by Each State on Highways Last Year—New Mexico Highway Conditions.

Returns giving information of highway work done in the states of Ohio and New Mexico were received too late to be included in the tables published in our issue of April 30. The information is given herewith, but in the form of a running statement, rather than a table, as only two states are represented.

The Ohio returns were furnished by State Highway Commissioner James R. Marker, and the New Mexico figures by James A. French, state engineer and engineer of the State Highway Commission.

In Ohio there were in use on January 1, 1914, 55,268 miles of earth roads, 15,652 miles of gravel, 12,103 miles of water-bound macadam, 41 miles of bituminous macadam built by state aid, 57 miles of cement-concrete, 21 miles of concrete with bituminous top, 440 miles of brick and 99 miles of cinder, marl, etc.—a total of 83,681 miles.

During 1913 there was constructed by the state department 2.75 miles of water-bound macadam, at a cost of \$11,789.98; 1.22 miles of bituminous macadam, at a cost of \$5,812.10; 1.35 miles of brick, at a cost of \$11,733.85—a total of 5.29 miles, costing \$29,335.93.

There were built by state aid 9.69 miles of gravel, at a cost of \$26,195; 74.94 miles of water-bound macadam, at a cost of \$422,672.32; 13.90 miles of bituminous macadam, at a cost of \$101,365.63; 4.07 miles of cement-concrete, at a cost of \$35,241.92; 19.10 miles of concrete with bituminous top, at a cost of \$196,953.32; 40.44 miles of brick, at a cost of \$592,211.44; also grading included in the above mileage, which cost \$23,994. This gives a total construction by state aid of 162.14 miles, costing \$1,398,633.53. The total amount spent by the state during 1913 was \$689,620.50 for state aid construction, and \$16,828.08 for state aid maintenance and repair—a total of \$706,448.58. There is available during 1914 state aid for each of the 88 counties of approximately \$26,400.

In New Mexico the highway commission has not yet been able to obtain and tabulate complete information concerning its roads, but is making progress along this line as rapidly as possible. The approximate figures for the amount of roads in use in the state in January, 1913, were: For earth roads, 245 miles, and for gravel roads, 56 miles. During the year 1913, 16 miles of gravel roads were built by the state, at a cost of \$2,000 per mile. The total amount spent by the state during the year

was \$121,631, and the amount available during 1914 is \$120,456. There is also to be spent by the counties \$387,194, of which \$65,675 must be used in paying for bridges built or being built under existing contracts. A considerable part of the highway commission and county funds is, we understand, to be used for bridges.

The machinery and appliances used by the state of New Mexico are given as follows: Ten 2-horse and 4-horse plows for dragging and turning, 100 Fresno and slip scrapers (no drag scrapers) for grading, four Indiana and one Twentieth Century graders, five King drags, nine Bain 1½-yard dump wagons for hauling gravel, four hand-made tank wagons for sprinkling, and two 2-inch centrifugal pumps for supplying water.

Work done by the counties in both road and bridge construction is generally under the supervision of the highway commission and state engineer, the county commissioners in some cases appointing the state engineer to take direct charge of bridge construction.

Systematic dragging of the roads is precluded by the fact that the rainfall in the lower valleys averages only eight inches, and this falls within two or three months, while a large part of the higher precipitation in the mountains comes in the form of snow during the winter. More than half the area of the state is covered with mesas or plains, formed of clay and gravel deposits mixed in a proportion which furnishes good roads for large traffic without any considerable amount of work. Roads over these mesas made by wagon wheels alone, and traveled for years, are in good preservation, and have been generally adopted in the state highway system. New roads of this type are being constructed by a Lister plow point on the ends of timbers dragged and spaced from 56 to 60 inches apart. Several miles of road a day may be made by these plows. Probably half of the mileage of the state highway system is of this type of road. In the mountains the roads are built of material from the side hill cuts, properly crowned and drained. A maximum grade of 6 per cent is adhered to on the state roads. The roads are surfaced with decomposed granites, lime or sandstones or gravels obtained close at hand.

In the rivers and valleys are found stretches of sand, adobe and irrigated lands. For roads over the first named, a clay covering four to six inches deep is placed on the sand, and gravel is placed on this to a depth of nine inches. The road is then left for traffic and rains to compact, which takes place within six months, more or less, according to the amount of rain; the roads being dragged meantime following each rain. This method has proved very successful. In the adobe stretches, standard types of graders are used for ditches and crowning; gravel is then placed in the same way as on the sand stretches, and the road treated in the same way. Roads in the irrigated lands are graded by slips, Fresno scrapers or grading machines, as convenient, and are then graveled, sprinkled and rolled. This keeps the road material in shape for traffic. Dragging is practical upon roads in the irrigated sections, owing to the fact that habitation is centred along these tracts, but is considered impractical on roads over the long sand and adobe stretches, owing to the scarcity of inhabitants available for the work; the rain evaporates so rapidly that it is impossible for one or a few men to cover the entire roadway before it dries out.

The State Highway Commission has designated a system of highways approximately 3,710 miles in length, of which 50 per cent comes under the head of mesa road. Convict labor is used, the prisoners being in camp without guards, and solely upon the honor system. They are under the direct charge of the commission.

Comparatively few escapes are made, as care is taken in the selection of the men for this work. While in general efficiency they are not equal to paid labor, yet a saving in money value to the state is obtained by their use, to say nothing of the social and moral betterment resulting. In 1913 about 90 convicts were employed continuously.

MILWAUKEE CREOSOTED BLOCK PAVEMENTS

Reason for Changing from Sand Cushion on Streets Carrying Car Tracks—Annual Hot Oil Treatment— —Bulging—Maximum Grade.

By FRANK W. BLODGETT.*

Creosoted block for paving purposes has been in use in Milwaukee, Wis., for only the last six years, the first pavement being laid on Wells street in 1907. With the exception of a change in the specifications for the cushion, the same method of construction has been followed for each pavement laid since that time, namely a 1:3:6 concrete foundation six inches in thickness, a 1-inch sand cushion and a 3½-inch block treated with 16 pounds of oil. About 90 per cent of the blocks used are the long leaf yellow pine, the balance being tamarack.

The following paragraphs from the specifications give a good idea of the pavement:

The blocks shall be treated with a creosote oil elsewhere described and each block shall contain at least sixteen (16) pounds of creosote oil per cubic foot of wood.

The oil used shall be a coal tar product, free from adulteration of any kind whatever, and shall comply with the following requirements:

1. The specific gravity at 38 degrees Centigrade shall be not less than 1.07 or more than 1.12.
2. The oil shall be completely liquid at 25 degrees Centigrade, and shall show no deposit on cooling to 22 degrees Centigrade.

The blocks ready for use shall not absorb water more than an average of four and one-half (4½) per cent of their dry weight after heating at one hundred (100) degrees Fahrenheit during twelve (12) hours and then placed under water twelve (12) hours.

The blocks are to be laid on the sand cushion as soon as the cushion is ready to receive them. The blocks are to be laid with close joints and at an angle of 67½ degrees to the curb except where otherwise directed, and in uniform courses, and shall break joints by at least three (3) inches. No closure or end blocks shall be used which are less than three (3) inches long.

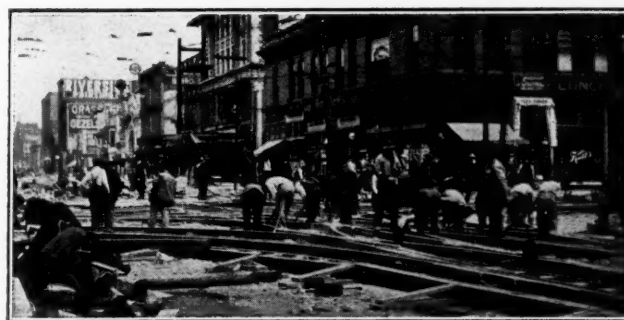
One row of blocks shall be parallel with the curb and three-quarters (¾) of an inch therefrom. The space thus formed between the curb and this row of blocks shall be filled with a coal tar pitch paving filler and conform to the following specifications: The pitch shall be the residue of

the distillation of pure coal tar only. It shall have a melting point between 145 degrees and 155 degrees Fahrenheit, determined by the cube method.

After the blocks have been properly laid and rolled or rammed, the joints shall be filled with coal tar paving pitch filler as hereinbefore specified.

As soon as the paving pitch has filled the joints between the blocks and ceased to settle, there shall be spread over the entire pavement a half (½) inch layer of clean, very coarse, dry sand, or a layer of clean, hard, dry, crushed stone screenings, with particles not exceeding one-fourth (¼) inch nor less than one-thirty-second (1/32) inch in size. This layer of either coarse sand or crushed stone screenings is to remain on the pavement while subjected to traffic for a period of a month, or until any excess is removed by the city.

From 1907 to 1912 the blocks were set on a one-inch sand cushion. It was noticed on the streets over which street cars are operated that, after the pavement had been laid for about a year, the blocks along the rails and, in extreme cases, for a distance of about three feet from the rails, settled badly. A careful investigation disclosed the fact that after a rain storm, the movement of the rails pumped out a small part of the sand from below the blocks and in time so much sand was pumped out that the blocks dropped down. To remedy this, the specifications in 1912 were changed so that in place of a sand cushion, a cushion of cement and sand mixed in the proportions of one part of cement to four parts of sand was used on all streets carrying street car traffic. The result



LAYING WOOD BLOCKS IN MILWAUKEE, 1913.

has been that no further trouble has been experienced with the settlement of blocks along the tracks.

There has been laid in the city up to the present time, approximately 102,000 square yards of creosoted block pavement, of which amount 51,000 square yards or 50 per cent was laid in 1913. With the exception of the trouble along the street car tracks heretofore mentioned and a small bulging of the State street pavement in the winter of 1912-1913, the city has not spent a cent for

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Details of Wood Block Pavements Laid in Milwaukee During Past Seven Years.

Street	From	To	Laid in	Cost	Sq. Yds.	
State	27th	35th	1913	2.67	11740	¾ Cement-Sand Cushion.
Grand Av.	Mil. Riv.	4½	"	3.18	9160	"
Wells	W. Water	6th	"	3.18	8330	"
W. Water	Sycamore	Cedar	"	3.18	8440	"
3rd	Sycamore	Cedar	"	3.18	7440	"
6th St. Via	Sycamore	Cedar	"	2.13	5700	"
6th St. Via			1912	2.14	3200	"
N. Av.	Humboldt	7th	1909	2.81½	27550	1-inch Sand Cushion
State	5th	7th	"	2.63	4110	"
5th	Cedar	State	"	2.63	1940	"
6th	Cedar	State	"	2.78	1400	"
Cedar	5th	6th	"	2.78	2610	"
11th	Cedar	State	"	2.58	2600	"
Wells	28th	31st	1907	*3.05	4650	"
Wells	31st	33d	"	3.23	3100	"
					101970	

*Includes removal of old cedar block pavement and about 3 inches of grading.

Prices in all cases include 1 inch cushion and 6 inch concrete foundation.

The reason for the cost of \$3.18 for the pavements laid in 1913 was the fact that the work was done in the business district of the city where cost was sacrificed to speed and the maintaining of traffic conditions.

Sixth street viaduct does not include concrete foundation.

maintaining the pavement. About 22,000 square yards is in purely residential districts, and the remaining 80,000 square yards is laid on streets carrying the heaviest traffic in the city.

The before mentioned State street pavement, which gave some little trouble by bulging, was laid in 1909 and a test of several of the blocks taken out at the time of the bulge showed an absorption of water of between 10 and 11 per cent. The weather had been very wet for some time preceding the bulge and a sudden drop in the temperature to about 10 degrees above zero, causing the expansion of the water contained in the blocks, was undoubtedly the cause. It is proposed to guard against this trouble by giving the blocks over 3 years old a surface treatment of hot oil each year, which method has been successfully used in other cities. An examination of the blocks laid on other streets discloses the fact that up to the present time there has been no perceptible wear.

On Grand avenue, Wells street, West Water street, and Third street, paved in 1913, the cost was \$3.13 per square yard, this including the 6-inch concrete foundation and a 1-4 cement-sand cushion. The fact that these streets are the principal business streets of the city presented difficult conditions for the laying of the pavement, accounting for the high cost, it being necessary to maintain traffic conditions as far as possible while the pavement was being laid. The lower cost of the work done on the Sixth street viaduct (see table) is due to the fact that it was a repaving job done on an existing concrete foundation and includes only the paving and a 1-4 cement-sand cushion.

We do not lay and would not recommend the laying of a creosoted block pavement on any grade exceeding two per cent. It is an undoubted fact that during the winter season, especially after the blocks begin to absorb moisture, it is a slippery pavement, as however is also asphalt and granite. This condition is met by sanding the pavements, using a sand spreader. One of these spreaders will cover about 60,000 square yards of pavement in a day, effectually overcoming the slippery condition. We have had some success with rolling fine granite into the pavement with a heavy roller immediately after the pavement has been laid and are proposing to work further along these lines this season.

We expect to lay during 1914 about 40,000 square yards, 10,000 square yards of which is already contracted for at a cost of \$2.63 per square yard. These are 3½-inch blocks, 16-pound treatment, and the price includes a 6-inch 1:3:6 concrete foundation and a 1:4 cement-sand cushion.

The table shows the location of wood block streets, yardage, cost and year laid. There has been no maintenance charge up to the present time due to any fault of the blocks themselves.

BITUMINOUS ROADS AND ECONOMY.

From experiments made during the past three years, together with a careful watch of the regular methods of construction in New Jersey, Robert B. Gage, chemist of the state geological survey and in charge of the testing of road materials for the department of public roads, has reached the following conclusions concerning bituminous construction:

The construction of expensive bituminous pavements should be confined to main roads and localities where this type of construction is the only one that can be economically maintained. If the difference between the price of a thin top (which could be easily and cheaply replaced) and an expensive pavement is put into a proper base and drainage system a permanent improvement is thus secured. Then, if the condition of travel changes upon such a road

and the present pavement is no longer capable of being economically maintained under the changed conditions a new pavement can be constructed that will meet the requirements of the changed conditions, for a proper foundation for such a pavement already exists upon the road.

It is not advisable to apply expensive bituminous surfaces to old macadam bases, and risky to lay them on new macadam bases. The base of an old macadam road is a very uncertain quantity and practically never properly drained. When a bituminous pavement is applied to a new or repaired macadam base it should never be a dense, brittle pavement, but one which is semi-elastic, even in cold weather, and should be porous beneath to prevent the ingress of water from the base through capillary attraction.

Hard and dense bituminous concrete pavements of a uniform composition should be laid on properly drained concrete bases which are not subject to movement or displacement. The costs of these pavements are such that it is poor economy to subject them to the adverse conditions which usually exist upon macadam bases.

Bituminous roads constructed by the penetration method have most generally proven to be a failure. They cost from 50 per cent. to 75 per cent. of the price of a good bituminous concrete pavement, and seldom give 50 per cent. of the service of such pavement. They often need repairing at the end of the first year and sometimes are total wrecks in three years' time.

PRIVATE BRIDGES OVER PUBLIC STREET

The Erection of Bridges and Passageways by Private Corporations Over Public Highways—Regulations in Several Cities.

By ANDREW LINN BOSTWICK.*

A study of this subject reveals more or less lack of uniformity in the regulations in force in our large cities. Information has been received from fourteen municipalities. In ten of them private corporations are allowed to construct bridges over streets and alleys; of the other four, one prohibits them, one has no legislation on the subject but tolerates their erection, and two report that the matter is in doubt. In the cities that permit the bridges, the usual procedure is to provide for approval of the plans by the engineering authorities and for the subsequent granting of the permission by ordinance. The ordinance is generally passed, not by virtue of any specific charter provision on the subject, but under the broad control given the city over its streets. In the case of St. Louis a general ordinance has recently been adopted which provides for the passage of a special ordinance for every private bridge grant made. As a rule, cities charge no compensation for these privileges. Chicago furnishes an important exception, which will be taken up later. In Philadelphia and Cleveland, the grantee must pay the cost of publication of the ordinance, and in Buffalo a special point is made of taxing all private bridges. The filing of a bond with the city is sometimes required of the grantee.

Based on the data received from the fourteen cities under consideration, the conclusions are that these private bridges are usually allowed; that as a general thing no compensation is charged for the privilege, but all plans must be approved by the proper city authority, and the city must be secured against damages by the grantee.

REPORT BY CITIES.

Chicago.—The regulations in Chicago are rather complex as well as interesting, and are given in detail. Privileges for private bridges and passageways are divided into two classes; one authorizes bridges of limited size, both in height and width, for connecting purposes only, these grants being for a period of ten years, subject to repeal by the Council or revocation by the Mayor at any time; the other authorizes more permanent structures

*Municipal Reference Librarian, St. Louis Public Library.

such as would be used to connect the various floors of large commercial establishments on opposite sides of a street or alley.

The compensation charged for the first class of bridge is based upon the aggregate floor space in the entire bridge, the charge being $7\frac{1}{2}$ per cent of one tenth of the average assessor's value of the abutting property, with a minimum charge of \$25 for a bridge one story in height, \$50 for a bridge not exceeding three stories in height, \$75 for a bridge not exceeding four stories in height, and \$100 for bridges five stories or over.

The second class of bridge, as stated above, is a more permanent type of structure, and is used not merely as a passageway but also for commercial purposes, as a part of the buildings which it connects. Grants for structures of this sort have been made for a period of 20 years, without the power of repeal or revocation by the Mayor or Council. These grants are practically a 20 years' lease of the city's rights in the property, both above and below the surface, with the exception of the ground floor, which must remain open. These leases are based upon an appraisal of the ground value, the space above and below the first floor being estimated as worth 40 per cent of the entire rental value of the property at the rate of 4 per cent. Owing to the fact that the land is not subject to taxes, an appraisal is also made of the amount of taxes which would be required annually on the entire piece of property, and 40 per cent of this amount also is added to the rental. Under such contracts the great department stores have constructed or are constructing a number of bridges, some of them as much as 12 stories in height. The permission is granted through application made to the City Council; the application goes to the Streets and Alleys Committee, which passes upon the advisability of authorizing the work. If the passage of the permit ordinance is recommended, the ordinance is referred to the Compensation Committee for the fixing of the compensation, after which it is reported back to the whole Council for final action. In the case of bridges of the first class, the city requires a bond in the sum of \$10,000 to protect it against damage and to insure compliance with the terms of the ordinance; in the case of bridges of the second class the bond required amounts to \$25,000.

Philadelphia.—Authority to erect bridges is granted by special ordinance, such ordinance stating the clearance and span distances and providing for submission of plans to the Board of Highway Supervisors and for the filing of a suitable bond with the city solicitor. The Art Jury must approve the plans also, as in the case of any bridge erected in the city.

Following is a typical ordinance:

The Select and Common Councils of Philadelphia do ordain: That permission be and the same is hereby given to the John H. Clark Company to construct and maintain a bridge over and across Ludlow street, west of Fourth street for the purpose of connecting premises, 406 Market street, with premises commonly known as the "Bourse Building," the said bridge to be of steel frame covered with sheet metal and glass, and not to exceed 8 feet in width and have a clearance not less than 99 feet above the surface of the street, and shall be constructed under the supervision of the Department of Public Works in accordance with plans to be approved by said department. Before exercising any privilege under this ordinance, the said John H. Clark Company of Pennsylvania shall enter into an agreement satisfactory to the City Solicitor indemnifying the city against all damages by reason of the construction and maintenance of the said bridge and remove the same upon passage of an ordinance by Councils to that effect, and shall pay into the City Treasury the sum of \$50 for the publication of this ordinance.

St. Louis.—Until recently a permit from the Board of Public Improvements was all that was necessary for the

erection of bridges by private corporations over streets and alleys. In November, 1913, an ordinance was passed providing that no such bridge should hereafter be erected without permission by special ordinance. Before such special ordinance may be passed, the plans must be approved by the Board of Public Improvements. The actual work of construction must in a general way be watched by the street commissioner's department.

Boston.—There is no law covering this matter in Boston, and private bridges over streets are not allowed. Chapter 680 of the Laws of 1913 (Mass.) authorizes the Board of Street Commissioners to make rules and regulations regarding the placing of signs, awnings, etc., and "other structures" projecting into or placed on or over a public way. It is believed that this term "other structures" may be construed to include bridges. The rules and regulations in question have not as yet been finally adopted, although a tentative draft has been made. If this draft is adopted, applications for bridge construction will undoubtedly be made, and the matter decided one way or the other.

Cleveland.—Section 173 of the city charter gives the city general control over its streets, alleys and bridges. In accordance with this, ordinances have been passed granting permission to private corporations and individuals for bridge construction. A typical ordinance of this sort provides for location and construction in accordance with plans on file with the original bill; for removal at grantee's cost, on written demand by the city; for release of the city from all damage claims resulting from the construction and maintenance of the bridge, and for written acceptance of the conditions of the ordinance by the grantee.

Pittsburgh.—Permission for private bridges is granted by ordinance, after approval of the plans by the director of public works. This department supervises the work of construction also. A typical ordinance provides, besides the above, for a clearance of not less than 24 feet, and for removal of the structure, at grantee's expense, on 60 days' notice.

Buffalo.—In this city a resolution passed by the Common Council is necessary to permit overhead passageways or bridges. Plans must be submitted by the petitioner. A typical resolution requires that a bond of \$5,000 be filed with the comptroller. These bridges are all subject to an annual tax by the Board of Assessors.

San Francisco.—There are a number of private bridges in this city, permission in each case having been granted by the Board of Supervisors.

Milwaukee.—Although the nature of the city's control over its streets is such as to theoretically make it impossible, or rather illegal, for permission to be granted for bridges over streets and alleys, it has nevertheless been customary for the city to grant such permission. Chapter 382 of the Laws of Wisconsin, 1913, authorizes the city, moreover, to charge compensation for privileges of this sort, but in view of the above facts the law is probably unconstitutional.

A typical ordinance specifies a minimum clearance of 14 feet, provides for assumption of all damage claims by the grantee, and reserves the right of repeal at any time.

Los Angeles.—Los Angeles contains only a few private bridges, over alleys. In all these cases the original dedicators of the land now forming the alleys reserved the right to construct these bridges. Permission for new bridges of this sort would probably have to be granted by special ordinance.

Kansas City, Mo.—There are no private bridges over streets in Kansas City, but several over alleys. In each case a special ordinance was passed, such ordinance sub-

ject to repeal. The ordinance must first be approved by the superintendent of buildings and the fire warden. The Building Department has jurisdiction over the construction of the bridge. None of the bridges are over two stories high, and special care has been taken to keep them fireproof.

Indianapolis.—In this city there are about a dozen private bridges, all of which were erected without any permit or authority of any kind. While illegal, they are tolerated. There is no law governing the matter specifically.

Denver.—Denver has a few bridges over alleys, which were authorized by permit from the council. The usual policy is to prohibit these structures entirely.

Memphis.—Permits for bridges over streets and alleys are granted by the City Commission, and are revokable at any time. The city contains only four such structures. In all cases there must be a 14-foot clearance over the curb.

LEGAL RIGHTS IN TREES

Cities' Ownership of and Jurisdiction Over Trees on Public Highways—Rights of Private Owners—

Liability for Damages

By C. O. ORMSBEE.

As a matter of law, except when modified by statute or municipal charter or by the terms of some previous transfer, a city has absolute ownership of and jurisdiction over all the trees that are located within the limits of the public highway, except that it may not wantonly or unnecessarily cut or mutilate them. In case, however, by the terms of the easement under which the municipality gains title, the original owner retains an adverse right, as, for instance, when the tract is deeded for highway purposes only, or when a clause provides for a reversion in case the municipality fails to comply with the terms of the easement, and the subsequent transfers of the abutting tract of land have conveyed this adverse right to the present owner, such trees, when cut, become the property of the abutting owner, unless the municipality requires them to repair the road or street in the immediate vicinity. That is, ownership of the trees, when cut, rests with the abutting owner, provided he has an established adverse right. In case the municipality gained its title by virtue of a warrant deed, without reservation, the original owner, having surrendered his entire title, cannot claim any adverse right. Neither can he transfer any such right to any subsequent purchaser, and the abutting owners have no more rights in the premises than the public in general. When an adverse right is reserved and the boundaries of the tracts of land subsequently granted are defined or construed to extend only to the outer boundary of the highway, no grantee can gain any adverse right by reason of being an abutting owner. If any such right exists, it rests in the original owner and not in the abuttor. In most instances such adverse rights to county roads are transferred to each successive grantee. But when a tract is divided and subdivided into city lots, the adverse right is usually lost.

In any instance a municipality has the legal right to remove any tree or part of a tree standing within the limits of the highway if the convenience of the public demands such removal. Suit may be brought by the abutting owner, or by any other citizen, to restrain the municipality or its employees from making such removal, but the question of whether or not the public convenience requires it is the only point the court will consider, and the burden of proof, will, in all cases, rest with the

complainant. The city may also remove any trees or parts thereof if such removal will add to the beauty or attractiveness of the city. It is the duty of a city to remove all trees and parts thereof that, by reason of defective condition, are or are liable to become a menace to the safety of the public. In the exercise of this duty the employees of a city may lawfully enter upon and injure or even destroy private property, provided such entry and injury is necessary in order to effect the removal. But in all such cases the city is liable to the owners for all damages.

A city may remove those parts of a tree standing on private property that overhang the public streets and interfere with ordinary travel. But it must not remove any part of a tree back of a plane parallel with the street and extending perpendicularly from the outer boundary of the street, or it will become liable in a suit for trespass. Neither can it lawfully remove a branch for the convenience of extraordinary or unusual travel, as for the moving of a building. Nor can it lawfully remove a privately-owned tree or any part thereof in order to facilitate the construction or operation of a telephone or electric light wire, unless the system is owned and operated by the city. Private and foreign lines must look to their charters for such permission. A city may, however, enter upon private property and remove a tree that by reason of its unsightly appearance, in comparison with the neatness and general appearance of the street, so offends the eye as to become a nuisance. And it is its duty to remove privately-owned trees which, by reason of their weak and defective condition, are a menace to the safety of the public. But, in such cases, the city will be liable to the owners for damages, the amount of which will depend to a very great extent upon whether or not the condition of said tree was such as to warrant such entry and removal; and here the burden of proof will rest largely with the city.

A city may be held jointly liable for damage to individuals if injured when on the public street by the falling of a privately-owned tree, if it was previously apparent or if the proper officials had previously been given notice that the condition of the tree was such as to render it unsafe. Usually also a city may be held liable for all damages arising from the falling of its own trees or branches; but, in some states, it has been held that the condition of the trees must be such as to make it plainly perceptible that they are unsafe. These rules do not apply to injuries received by reason of trees being blown down or branches being broken off during an unusually severe storm. Neither do they apply to damages sustained by telephone or other similar corporations, it being held that such companies assume all such risks.

The state charter, and also the municipal charter, granted to a telephone or to other similar companies carries with it the legal right to remove branches and even trees in order to facilitate the construction and operation of their lines, and they have an undoubted right to do so upon payment of the reasonable damages. But they have no right to unnecessarily remove or injure a tree; and if they do so they may be prosecuted as trespassers.

It is the policy of most cities to encourage the planting of trees by citizens and abuttors along its streets, when this can be done without interference with its traffic; but a city has the right to require that suitable varieties be planted, and it should at all times exercise this right by the enactment of ordinances prohibiting the planting of any but desirable varieties. But tree planting by individuals within the limits of the public

highway, if done at all, must be done by the consent and approval, either implied or specified, of the city authorities and not by virtue of any so-called legal right, for no such right exists. A person so planting trees gains no adverse rights whatever. Once planted they become the property of the municipality, except for the reservations already mentioned, and the abuttor has no legal right to remove them. If he does so he may be punished according to the statutes provided for such offences. In those states where there are no laws touching especially upon this offence, action for trespass may be brought against him. It is the policy of the city to encourage its citizens and especially the abuttors in the care and judicious pruning of its trees. But this policy or tacit consent conveys no adverse rights; and any citizen is liable to prosecution if he intentionally injures or mutilates a tree belonging to a city. An abuttor has not even a right to remove the branches which overhang his premises, even though they may crowd against and injure his house. He may, however, require the city to remove them, or to recompense him for the damage done and inconvenience caused by the encroachment. This is according to the principle that a municipality may take private property for public purposes on payment of the value thereof. Neither has an abuttor a legal right to remove a tree standing upon his own premises, if any of its branches overhang the highway. The city has a joint ownership of and an interest in those branches and a right to their shade. A city also has a joint interest, but one that is not clearly defined, in all trees which, from their location, add to the beauty and attractiveness of the city; and it may prohibit by ordinance the removal of any or all trees within its limits except by permission, and then it may decline to give the necessary permit.

This right of prevention, however, cannot extend to the minor municipalities, for if it did the authorities might prohibit the cutting of timber or of firewood. Nor will it be sustained elsewhere except in those cities and the localities in such cities where the municipality is taking all practicable steps to embellish and improve the general appearance of its streets in that vicinity.

Of course it will be understood, as stated in the first paragraph, that these rules apply only in those instances where neither the public statutes of the state nor any other conflicting elements prevail.

SEWAGE TREATMENT PLANTS IN OHIO.

It is probably unique within the history of sewage treatment in the United States that bids are to be received within a period of six weeks for three large plants located within sixty miles of each other. The cities contracting for these plants are Akron, Canton and Cleveland, O., which will receive bids for sewage disposal plants on June 16, June 26 and July 1 respectively.

It is interesting to note that the three plants are of different types, that of Canton consisting of sedimentation tanks and contact beds; that of Akron of sedimentation tanks and sprinkling filters, and the plant at Cleveland (which is to serve a district furnishing about one-sixth of the total flow of sewage of the city) will consist of grit chambers and fine screens. The grit chambers in the last-named plant are of temporary construction, and the screens will be placed in a temporary wooden basin, and will not be paid for until they have fulfilled the claims of the makers. Although the three plants differ from each other to such an extent, they were all designed under one consulting engineer, R. Winthrop Pratt.

OUT-OF-REPAIR CONDITION AND ECONOMY.

In a paper read last month before the First Canadian and International Good Roads Congress, Will P. Blair, secretary of the National Paving Brick Manufacturers' Association, had the following to say concerning one phase of economy:

"Cost of construction and cost of repair and all else is not the full measure of economy. But the greatest element affecting the economy of any road is, strange to say, the very one that is least taken into account, and that is its out-of-repair condition. That road that calls for the most frequent repairs is the road that is most likely to be out of repair, and it is the road that, in the sum of lapses of time in which it is out of repair, aggregates a total detraction from the road's worth, which, by the lesser load hauled, the broken spring, the injured horse, the extra wear and tear of the vehicle, if converted into dollars, would often equal in a short period of time the entire original cost of the improvement.

"I would impress and emphasize this feature of road economics. When a road is out of repair your road investment is bearing no interest. The road as a whole is only as good as its worst portion; even the rule of averages will not apply. On the other hand, by inverse ratio the road approaches its maximum worth as repairs are eliminated. The road, therefore, from which repairs are practically eliminated is the real economic road, provided only that the traffic passing over it meets, in a reasonable toll charge, the interest on its cost.

"This leads to the proper differentiation as to the choice of the road and the amount of its cost. The expenditure for any road is justified so long as the amount of tonnage passing over it will aggregate a toll equal to a reasonable interest charge thereon. To the extent that it exceeds such a sum, it represents a profit to the user.

"The use of vitrified brick is properly placed within the limits of the excessively used highways and important thoroughfares of the country. Such roads are to be found from points where travel converges and terminates at large centers of distribution. It also includes such roads as connect up centers of trade and population—in other words, the main market roads and thoroughfares of the country.

"The original cost of a brick road is not necessarily excessive. The cost of grading, drainage, bridging and the entire preparation for placing thereon the artificial foundation and wearing surface should be alike for all types, and is therefore no more expensive for a brick road than is required for the least expensive type of wearing surface. This necessary preparation in the case of a brick road bears a feature of economy that is well worth while to mention. It is not readily injured, either from wear and tear or from any character of climatic influences. It is likely to remain intact. With the brick wearing surface placed upon it, ample protection for the durability of all the work incident to such preparation is afforded.

"The public receives in exchange for its money a public highway at a cost that cannot be regarded as excessive, the up-keep of which is at least next to or equal to that of a properly constructed granite surface, covering a long period of years, subject to the most insignificant repairs, if any at all.

"By unquestioned evidence the life of a brick roadway can be estimated to be much beyond that of a generation. The maximum worth of such a street or road is attained by reason of its continued good condition. It is never out of commission; no out-of-repair condition; a condition satisfactory for use away and beyond a place in road economy."

WOOD BLOCK PAVING IN LOUISVILLE

Experience of Five Years—Bleeding Due to Heavy Filler, Not Experienced with Light Filler—Cause of Heaving.

By D. R. LYMAN.*

The first creosoted wood block pavement in Louisville, Ky., was laid in 1909, largely in the nature of an experiment and in the face of many predictions of failure. The 7,352 square yards laid that year proved so satisfactory, however, that in 1911, '12 and '13 18,800 square yards were laid.

The 1909 pavements were of yellow pine blocks 4x8x3½, treated with 20 pounds of preservative having a specific gravity of 1.12. These were laid on a 6-inch concrete foundation and ½-inch mortar cushion with sand filler, and cost \$2.56 a square yard exclusive of excavation.

The later pavements have all been of yellow pine blocks of the same dimensions, laid on the same base and cushion; but a filler of 1.08 specific gravity has been used. Twenty pounds of preservative and sand filler has been used in all cases but two; 2,574 square yards of pavement on Main street being given 16 pounds of preservative and an asphalt filler, and 2,364 on 4th street having 16 pounds and sand filler. The price of the latter was \$2.78 and of the former \$2.83, each exclusive of excavation. The price of the pavement let in 1911 was \$2.89, and that of the others let in 1913 was \$2.68, except one intersection which was \$2.84 including excavation.

All the wood block pavements are on the main streets, carrying heavy or medium traffic, that let in 1911 and completed in 1912 replacing granite blocks.

The preservative used in the 1909 contract was a straight coal tar oil with a specific gravity over 1.12, and the wood was treated with 20 pounds to the cubic foot. The blocks were laid on 6-inch concrete base and ½-inch of 1 to 3 cement mortar, the joints being filled with sand. In the street railway tracks the courses were perpendicular to the rails, but the remainder of the pavement was laid at 65 degrees with the curb.

During the first two summers these pavements bled profusely, but since that time this has ceased entirely.

All wood block pavements built since 1909 are also laid with yellow pine blocks, as described above, but the specification for preservative was changed so as to reduce the specific gravity to 1.08 and a very marked decrease in the amount of bleeding was at once apparent and the surface is materially less slippery than that of the 1909 pavements. The greater degree of slipperiness in the older pavements is largely attributable to the higher specific gravity of the preservative and the consequent deposit of a greater quantity of tar which has solidified on the surface.

Of the total 14042.9 yards laid in 1913, 4937.6 yards were laid with 16-pound blocks, 2573.6 yards of which are filled with asphalt, the remainder with sand. The additional cost for asphalt filler was fifteen cents per yard, but in the writer's opinion this added initial expense is more than compensated to date by the further reduction in slipperiness and the improved general appearance, and doubtless it will also add years of life to the pavement by keeping moisture out of the joints.

It recently became necessary to make several openings to repair gas mains in the pavement laid on Sixth street in 1909. Although subjected to fairly heavy traffic for five years the blocks showed a reduction in depth of less than one-sixteenth inch, which was probably due almost entirely to compression during the early life of the pavement.

The amount of reduction in depth is not perceptible on the surface and it was not known that there was a decrease until blocks were actually measured.

In Louisville there has been no serious trouble from buckling or heaving. The only instance of trouble was in a portion of the pavement laid in 1913 with 16-pound blocks and sand filler. As was the case in a large portion of the country, the summer of 1913 in Louisville was unusually dry and hot and the blocks were well bleached and dried before laying. In spite of constant instructions to pave loosely, a portion of the pavement was laid too tight and in consequence about ten square yards heaved off the mortar bed, but not to such extent as to break the surface, but this portion had to be repaved. No heaving has been experienced in the 16-pound asphalt-filled pavement.

The almost negligible cost of repaving this heave is the only expense which has been incurred in five years for maintenance, and the outlook as regards such expense in the future is very bright. The greatest peculiarity in wood block pavement, if it may be called that, lies in the fact that it improves with age and with the amount of traffic. Contrary to experience with most other pavements, the heavier the traffic and the harder the pavement is pounded, the better it becomes. This is quite apparent in different portions of the same street where there is practically no moving traffic next the curbs and where every joint is still perceptible, while towards the center the joints are almost entirely sealed by the traffic.

On the streets paved with wood block the grades do not exceed one per cent, but no hesitancy would be felt in laying it on grades up to two and one-half per cent.

STATE ROAD MAINTENANCE.

We give herewith, supplementary to information on this subject contained in our issue of April 30, a few additional items concerning the official or bureau which is entrusted with road maintenance work in many of the states, and also the general system employed in such work.

In Arizona, maintenance work is in charge of the state engineer and is attended to by caretakers.

In Colorado, maintenance is in charge of the various boards of county commissioners, each of which operates a maintenance gang.

In Illinois, the state highway department carries on the maintenance work for state aid roads by a general system of maintenance squads.

In Maine, the work is in charge of the highway department and is done under the patrol system.

In Massachusetts, the maintenance work is conducted in four divisions, each in charge of an engineer of the highway commission.

In Missouri, each county organization maintains its own roads under the overseer system.

In Montana also, the counties are in charge of maintenance, which is conducted under the patrol system of road supervisors.

In New Hampshire, the state highway maintains, by the patrol system, the trunk lines and some state aid roads. Other state aid roads are maintained by town selectment under the direction of the state highway department.

In New Mexico, the state engineer operates a maintenance squad for this work.

In Ohio, maintenance work is in charge of a deputy commissioner at the head of a bureau of maintenance and repair, and is performed by maintenance squads under superintendents.

*Chief Engineer Board of Public Works.

In Pennsylvania, this work is in charge of a maintenance department, under which are superintendents for the several counties, each superintendent having a field corps.

In Rhode Island, maintenance is under the direction of the state board of public roads, and is carried out by both the patrol system and section gangs.

In Vermont, each town maintains its own roads under state supervision, and the use of the patrol system is being inaugurated this year.

In Virginia, there is no general system of maintenance work or law providing for the same. Few, if any, of the states not included herein have made any provision for maintenance work under state patrol or supervision; the majority of them, in fact, having no state highway authorities.

ROLLERS USED BY PENNSYLVANIA STATE HIGHWAY DEPARTMENT.

June 1, 1914.

Editor, Municipal Journal,
50 Union Square, New York, N. Y.

Dear Sir:

In the road number of the Municipal Journal, April 30, 1914, Volume 36, No. 18, page 605, in the article on "Appliances used on State Roads," it is stated that the State of Pennsylvania has forty-one ten-ton rollers made by the Buffalo-Pitts, Austin-Western and Good Roads Machinery Company.

Through an error in compiling statistics in this office on which this article, in so far as it concerns Pennsylvania, was based, the Austin-Western Company was credited when as a matter of fact the Kelly-Springfield Company should have been mentioned.

I feel sure that you will be willing to publish this correction in the interests of fair play.

Yours very truly,

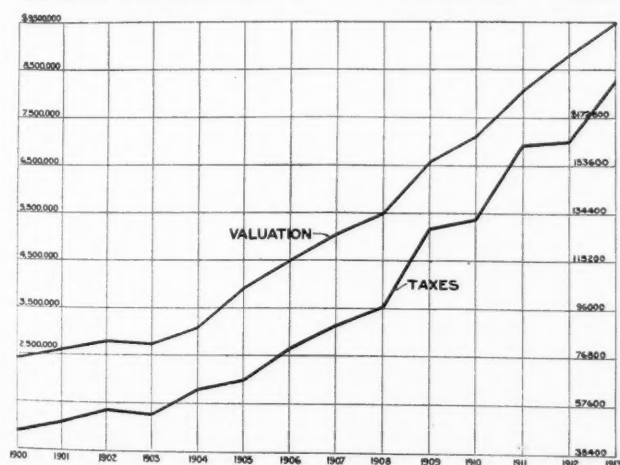
W. R. D. HALL,
Statistician, Pennsylvania State Highway Department.

TOWN EXHIBIT IN WESTFIELD.

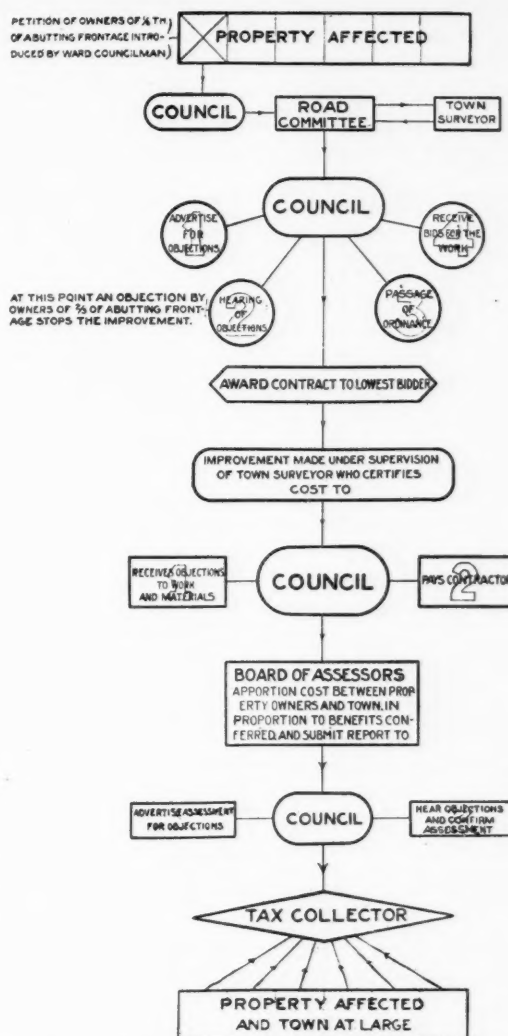
Westfield, N. J., a town of 7,500 population, has caught the spirit of the times in endeavoring to establish within its limits a more efficient citizen control over government. Such control depends to a large degree upon popular interest in and information regarding public business. These can be disseminated in various ways, but the board of trade of Westfield, headed by Arthur N. Pierson, adopted that of a well-planned town exhibit, showing graphically for what purpose each dollar of the taxes was disbursed, and pictorially the advances made in general municipal matters.

In the financial division of the exhibit, the receipts and expenditures for 1913 were indicated by areas of circles, the segments of which indicated the sources of income and the ends for which the town's money was expended. The funded debt of Westfield, less the sinking

CURVES SHOWING RELATION BETWEEN VALUATION AND TAXES



IMPROVEMENT PROCEDURE



fund and bond redemptions, were shown on charts. By curves, which we illustrate here, the visitor could see at a glance the relation obtaining for several years between valuation of property and taxation. Expenditures for 1913 under each item of the budget were compared to the whole and to the same item for the years 1905-1913 inclusive. Spanning a period between 1903 and 1913, the county, school and general town taxes were shown in their relation to each other and to the whole tax.

Full information concerning the sewerage system was given by a map showing the location of all sewers and by drawings of sections of the Imhoff tank, sand filter and disposal bed; also a model of the new Imhoff tank which attracted much attention, together with samples of sewage, in raw condition, after passage through the Imhoff tank, and finally after passing the sand filters.

The street commissioner showed just how the town's pavements were made, the kinds used and the location of improved streets. Cross sections showed the construction of four types of roads, cement sidewalks, and cement curbs and gutters. In this division was included also a chart, which we have reproduced, explaining the procedure followed in securing and paying for improvements.

To most taxpayers a meter appears to be a mysterious device for determining charges and often, to their way of thinking, overcharges. To dispel such illusions the public utility corporations demonstrated at the ex-

hibit the construction and operation of electric, gas and water meters.

The Police Department demonstrated the modernness of its equipment by showing a police call system in full operation, with a desk sergeant in charge. Weapons used by prisoners also were exhibited. The fire department exhibit showed the number of fires and fire losses, location of hydrants and alarm boxes, pictures of the fire department, past and present, as well as of appliances and apparatus.

That portion of the exhibit, the subjects of which may be classed under the head of community welfare, was naturally of greater interest to visitors. A board of health laboratory fully equipped and in operation was the center of much attention, as were the bacteria cultures, the pictures of model and unsanitary dairies, the exhibit of milk-testing apparatus and charts of the death and birth rates and the number of communicable diseases during 1909-1913. The District Nurses' Association had a uniformed nurse in attendance, and the object and scope of the association's work were explained.

Recreation, charities, photographs of Westfield in the various stages of its development, statistics of town institutions and educational matters formed interesting features of the exhibit. Parents were given an opportunity to see what work the pupils were doing at grammar and high schools by means of the special exhibits bearing on art, domestic art, science and domestic science, and learn the cost of maintaining the school system and its growth over a number of years.

Four thousand inhabitants of Westfield viewed the town exhibit—more than half the total population—and it is hoped and believed will take an added pride and interest in the municipal affairs of the town because of it.

"THE CITY MANAGER PLAN"*

How It Operates in Dayton, Ohio, the Largest City Which Has Tried It—Advantages Claimed for It.

By HENRY M. WAITE,†

The Commission-Manager form of government in Dayton is the application of the newest development in organization to a municipality. The Commission is elected by the people on a non-partisan and short ballot. The commissioner receiving the highest number of votes is the mayor. The five commissioners represent the Board of Directors of a corporation, and they select and appoint an executive, who is the city manager. He is absolutely responsible for the running of the city.

When I was called upon to come to Dayton, I met the commissioners, who are five plain, honest, upright business men, and as the people of Dayton were very much interested in the movement for a change in government, and had elected the Commission by a large majority, and all the people having been brought together by a peculiar chain of circumstances, I decided that if in any place in the country this form of government could be given a fair trial, it was in Dayton, and so accepted the position.

All the functions of the municipal government come under the city manager, outside of the legislative functions, which are in the hands of the Commission. The organization chart of Dayton is quite interesting, being based on the pyramidal form of five points. There are five commissioners as the legislative body who employ the city manager, or executive, and under him are the five operating departments.

The form of the Dayton organization is interesting

because the president of the Charter Commission, Mr. Patterson, who is president of the National Cash Register Company, in all of his organization charts carries out the idea of five departments, or a multiple of five. If he works a chart into fourteen sub-divisions he will keep at it until he gets fifteen, or he will go back to ten.

Each of the five departments under the executive in Dayton is headed by a director who is appointed by the city manager; there being: Director of Safety, which covers police, fire, weights and measures; Director of Service, who has charge of the water works; engineering; the construction, repairing and cleaning of streets and sewers; the collection of garbage and ashes, and the general supervision of all public utilities. The Director of Finance has under him the treasurer, the accountant and the purchasing agent. The Director of Welfare has all correctional institutions, hospitals, charities, parks, playgrounds, recreations, outdoor relief and social betterment and all community and social features. The Director of Law is the city attorney.

The appointment of these directors is the first step in the application of business methods to municipal government. Our Director of Law is one of the leading attorneys of Dayton. He was on the original charter commission and had more to do than any one else with the drafting of the charter. He accepted the position at a sacrifice to his own business.

The Director of Welfare was a minister. He is an executive. He was at the head of a very large parish, and is a man who was doing a wonderful work outside of his church. He has made studies of social conditions and social betterment; had traveled abroad and studied conditions in foreign cities as well as the cities in this country, and his greatest work was being done outside of the church. He accepted the position of Director of Welfare and resigned from his church.

The Director of Finance is a man from Dayton who had occupied in the various industries of Dayton the positions of accountant, purchasing agent and treasurer. When he was appointed, he was a member of a firm of public accountants.

The Director of Service is a man from out of Dayton. When it came to the appointment of the various directors, the commission and myself got together and they furnished me lists of the men who they thought had the characteristics and experience to fill the various positions. On the position of the Director of Service, however, they thought it advisable to bring a man from out of town, and so I selected a man who had had large construction experience, had been on the new aqueduct in New York; a man who had studied municipal work, and who had been my principal assistant engineer in Cincinnati.

The directorship of safety has never been filled, as we were not able to find the right man, and the city manager is now filling that position.

These directors, with the city manager, form the staff, and they meet every day for an hour and go over the important questions in each department, the same as would be done in a corporation. If there is a division of ideas in these staff meetings, a vote is taken, and while this particular function is not called for in the charter, it centralizes the entire organization.

Each director is responsible for his own department. Each director makes his own appointments, subject to the approval of the city manager, and the question of appointments is taken up at the staff meetings.

The commissioners, together with the city manager and the director of finance as secretary, form the sinking fund trustees. This brings all of the finances of the government inside of the central organization.

*Paper before the Fifth Annual Conference of Mayors of New York State, on June 3d; slightly abbreviated.
†City Manager of Dayton, O.

The municipal governments of American cities may be divided to-day into three classes: Federal, Commission and Commission-Manager. Take any city organization under the old Federal form and analyze it. Could any man operate his own private business with the organizations which we have allowed in our municipal affairs? We have here all kinds and conditions of individuality—some departments run by boards and commissions, and some are appointed, and some elected. In a number of our cities, the governor may appoint some of the boards or commissions. Could any man operate any business with an organization which we have handed over to him to operate? It is absolutely impossible to get efficiency.

Let us make a comparison of our present federal form of government with an organization like the Pennsylvania Railroad. Suppose the stockholders took it into their minds to elect an auditor, an attorney, a treasurer, another board to look after stations, grounds and buildings, and another board to look after their filing system and keeping records. Do you suppose the present president of the Pennsylvania Railroad would remain in the position? Would not the directors resign? Could you get a competent man to take charge of the railroad company with such an organization around him? You cannot select trained men in the particular functions of government through the ballot. It would be as reasonable to expect a large manufacturing plant, in the case of a vacancy, to go out and ask the neighborhood to elect some one whom they might suggest to fill the vacancy. We will not have efficient governments until we are able to select from the point of efficiency.

This is where the commission form of government has proved inadequate. The voters have not been able to select trained men to take care of the particular functions of government. It is usually customary for the commissioners, after election, to divide the various functions of government among themselves. Under the federal form whenever there is a political overthrow, the old organization is usually entirely wiped out and a new one put in. Could any private business stand such an operation?

This continuation of affairs on our part has built up political machines, run by a centralized power, and we ourselves have allowed it. We have not, in our governmental organizations, allowed for any centralized power, although we know in our own business that centralization is essential, and the political parties themselves have centralized around a boss, and we have allowed our cities to be governed by two parties; one party in power and entrenched, and the other party on the outside waiting for an opportunity to become entrenched. Our idea of municipal reform has been to throw out one party and put in the other. We have allowed these party organizations, one in and one out, to be moulded under our very hands. Their strength lies in organization, and the centralized power, or boss, holds his organization together with the idea that "to the victor belongs the spoils." We often hear that the city manager is nothing more than a boss, or centralized power. This may be true, but the conditions are not comparable, as under the old form of bossism the boss was unassailable; he was unofficial. Under the city manager form, the "boss" is assailable because he is official, and under our particular charter in Dayton, the city manager is subject to recall.

If I have made myself clear in the first part of this paper, you will understand that the Commission-Manager form of government does away at least with the conditions which have in the past hampered and made impossible efficiency under the old forms of government.

You have a commission elected on a non-partisan ballot, which represents the board of directors or the legislative body. They select the administrative officer who is directly responsible for the carrying out the administrative functions. His success depends upon his fitness and general capability. He selects men who have been specially trained for the work to be done, and in this selection he is not hampered by political promises. I cannot tell you to-day the political faith of any of the men I have appointed since I have been in Dayton. "Party" and "politics" are simply left out of the reckoning.

There is such an awakening in this country at the present time on the question of municipal government that we fear that too many will be rushing into unproved forms before the people are ready. Dayton was well prepared for the change. Over two years ago, there was started, through public subscription, the Bureau of Municipal Research, which made impartial investigations into each department of the city, and worked up a wonderful fund of data and caused many beneficial changes. It was constructive in its attitude, not destructive. It is the same procedure that is carried on in business corporations, but which has never been generally done in our municipal governments.

There is a general idea through the country that Dayton did not start the campaign for the change of government until after the high water. This is not true. They had started this research a year before, and a committee was organized in January to determine upon the method of procedure. Undoubtedly the high water caused the people to be drawn closer together, and aided in the rapid developments which have taken place in the change of government since the flood. We have one organization in Dayton which comprises about seven thousand people. This out of a population of 125,000, and it is heart and soul behind the new charter. In addition to that, during the campaign, a Citizens' Committee was built up from a regular ward and precinct organization which is used as an educational organization to get information to the people. This educational matter was gotten up by the Bureau of Municipal Research. This same organization got the people to the polls.

I should like to call the following very important point to your attention, and it is one I think the American people have lost sight of, but that they are now beginning to grasp: That it makes absolutely no difference what particular form of government the city may have, if the people themselves are not interested in it and do not participate in it, that government will never be a success.

ENCROACHING ON SIDEWALKS.

Pittsburgh has reached the point which most large cities arrive at sooner or later when it seems necessary to take drastic action to remedy the carelessness or supineness of previous years and compel the removal of the increasing number of encroachments upon sidewalks. In what is known as the north side of Pittsburgh, the First National Bank in erecting a white marble bank building provided for several stone steps extending two or three feet beyond the building line onto the sidewalk. Director Charles S. Hubbard ordered the bank directors to remove these steps as obstructions, but placing them inside the building will require a reconstruction of the first floor at great expense, and the bank officials protested, pointing to numerous other permitted violations of the city ordinance which prohibits the extending of steps or showcases upon the sidewalks. To meet this objection, Director Hubbard has issued or-

ders for the removal of all sidewalk obstructions. This order affects a large number of merchants, and a fight will be made in the city council to have the ordinance repealed.

TEXAS' LARGEST PAVING LETTING.

What is believed to be the largest single letting for street paving ever held in the south—certainly the largest in Texas—will be that at San Antonio the latter part of this month, as described in a proposal advertisement in this issue. Bids will be received on various kinds of pavements and 690,000 square yards will be contracted for—probably nearly a million dollars' worth of work.

San Antonio began several months ago to prepare for comprehensive paving of the city, employing Clarence D. Pollock (then in charge of the paving of Havana, Cuba) to take charge of the entire work of preparation and construction. This is the first step towards a very complete paving of the city, which will probably consume several years.

ROAD CONTRACT ITEMS.

In the contracts for road work let by the county commissioners of St. Johns County, Florida, this spring, the items on which payments are made are the linear yard of shoulder widening on both sides of the pavement; cubic yard of grading where the material is cast not more than 25 feet; cubic yard of grading where wheelbarrows are used, up to 100 feet; cubic yard of grading where the earth is hauled from 100 to 1,000 feet; and the pavement proper, per square yard. As far as we know, this subdivision of the grading into three items in accordance with the distance the material has to be moved is unusual in road work.

GRANITE BLOCK PAVEMENT.

The writer of the letter below seems to misunderstand the ideas of the author of the report which he criticises. Incidentally, he attributes the statements in this article to us, although, as stated therein, it consists of quotations from the annual report of the New York Bureau of Highways. At the end of his letter the writer commends the specifications of the Society for Standardizing Paving Specifications, but we believe that these specifications were largely the result of engineers in the highway bureau of New York City, and that the specifications to which he refers were and are employed by that bureau in purchasing its granite. Whether or not, however, Mr. Ramsay correctly understands the opinions of the author of the report, there will probably be few to dispute his opinion as to the desirability of toughness in paving blocks.

Editor Municipal Journal,
New York City.

Dear Sir.—Please permit attention to be called to certain inaccuracies in the article under the above caption appearing in the April 2, 1914, number of Municipal Journal. They have arisen from a confusion of the terms applied to the various physical properties of granite and a failure to differentiate between them. The variety of opinions expressed by engineers regarding the choice of granites for paving block purposes may be accounted for on the same ground.

Your article states that the granites referred to are listed in the order of their "hardness," but what you probably intended to say was that they were listed according to their "compressive strength." You also stated that Salisbury, N. C., granite is extremely "hard," but that is not the case; it is extremely "tough."

"Hardness" and "toughness" as applied to granites are two entirely different and unrelated properties. Engineers should get that fact firmly fixed in their minds. The United States government maintains at Washington, D. C., under the direction of the Office of Public Roads, a laboratory for testing granites and other road metals, to determine the four principal physical properties which are the factors

determining the suitability of the material for paving purposes. These physical properties are: Hardness, toughness, coefficient of wear, compressive strength.

The properties of "toughness" and "compressive strength" are closely related—so closely, in fact, that a granite having a high "compressive strength" will invariably show a good degree of "toughness"; but "hardness" is entirely unrelated to these two. A granite, or any other rock, may show a high degree of "hardness" and yet be structurally weak and unfit for paving purposes. Quartz, for example, has a high degree of "hardness" but is extremely friable and structurally weak.

It is the "toughness" of the material and not its "hardness" which determines how long the edges of a paving block will stand up under the traffic, and it is the ratio of "toughness" to "coefficient of wear" that determines whether or not the block will lose its edges long before it wears down under traffic.

An examination of the physical properties of a number of granites and syenites which have given good results under actual traffic conditions has shown that they are above the average in "toughness" and compressive strength. A notable example of this is found in the experience of the city of Liverpool, England. For twenty-five years that city has been using a granite porphyry from Penmaenmawr & Welsh Granite Company, Trevor, Carnarvonshire, Wales. It has a crushing strength of 42,480 pounds per square inch and a toughness of 28 (U. S. Standard, Office of Public Roads, Washington, D. C., Test No. 5668).

The city engineer is authority for the statement that some of these blocks have been down for twenty-five years and show very little wear and that blocks from the Welsh quarry stand up under the traffic at least five times as long as any other blocks they have ever tried on the streets of Liverpool. The results obtained are astonishing. Mr. Bulnois, formerly city engineer, says that when these granite pavements were first introduced Liverpool had 200 miles of pavement, which cost for maintenance \$185,275 and for interest and sinking fund \$76,303, making the total cost per mile \$1,307, whereas twenty-two years later, when the city had 258 miles of pavement, the annual maintenance cost was only \$68,752 and the interest and sinking fund was \$178,678, making the total cost per mile \$959. Thus the excellent pavements of the present day are costing the city 26 per cent less per mile than the poor ones which they replaced.

One reason for the long life of the English pavements lies in their smoothness, resulting from the small blocks and close joints; but the chief reason lies in the phenomenal **toughness** and **compressive strength** of the material, which is so tough that it wears like iron. Mr. Bulnois says in referring to the tramway tracks: "It was found from actual measurements and weights that in ten years the wearing surface or treads of Bessemer steel rails had worn down half an inch under tramways traffic of 318,689 tons per annum on each rail. The abutting syenite sets showed very little wear, except where the edges next to the steel rails were rounded off."

With the experience before us of Liverpool, with its exact traffic statistics and having at hand the data furnished us by the Office of Public Roads, Washington, D. C., Bulletin No. 44, it becomes perfectly evident that the physical properties to be considered in selecting granite for paving purposes are "**toughness**" and "**compressive strength**" and that the granite that stands high with respect to these will give the best results under traffic.

The Office of Public Roads, reporting the maximum and minimum results of tests of 223 samples of granite made prior to January 1, 1913, gives the lowest as 2 and the highest as 36, the average being 12. Rocks which run below 13 are classed as low.

The Society for Standardizing Paving Specifications, at its last meeting in Pittsburgh, Pa., incorporated the following clause in its stone block specifications: "The toughness to be at least eleven (11) as determined by the method employed by the Department of Agriculture of the United States Government."

Tests of granite for compressive strength show results as high as 51,990 pounds per square inch. It would seem, therefore, that a granite falling below 25,000 pounds per square inch should be regarded as deficient in that respect and that preferably it should be at least as high as 30,000 pounds per square inch.

The highway engineer should require that each contractor submitting granite blocks should furnish a certificate as to these two properties and should reject the product from quarries producing a granite deficient in those respects.

JNO. E. RAMSAY,
Consulting Engineer, Member Stone Block Committee,
Society for Standardizing Paving Specifications.

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JUNE 4, 1914.

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Sand Clay Roads.

The amounts of material used in road construction are enormous. A state which lays in one season 100 miles of 18-foot roadway uses about 200,000 cubic yards of material, measured loose. It stands to reason that economy and even necessity demands that most of this be obtained as near to the site of the road as possible.

In certain sections of the country rock suitable for macadam is not to be found; there is little gravel even, but sand and clay are abundant; and for such, the sand-clay road is the logical solution, or the clay may be made into paving brick (if its nature adapts it to this use) and laid on a natural sand foundation. The sand-clay road has given excellent satisfaction over hundreds of miles where the travel is not too heavy. How to construct it is explained on another page.

It should be carefully noted that maintenance of these roads is fully as important as construction—which is true of "dirt" roads generally. Through an entire season the road must be gone over after every rain and surfaced again, this resurfacing and the puddling by wheels and hoofs really being a part of a long-continued construction. This is exceedingly important, and neg-

lect of this attention has probably been the cause of most failures of such roads. But even with this it is probable that the labor item is no greater than that for a macadam road, especially as the cheapest labor in the country is to be found in most of the sand-clay territory; and the cost of the material is very small.

Cost of Pavement Repairs.

"When a road is out of repair the investment is bearing no interest," says Mr. Blair, in discussing "Out-of-repair Condition." The cost of repairing a road is not alone that of the labor and material, but also the hindrance to traffic caused. If the traffic is light this may be small; it may be possible to permit it to continue the use of the road while repairs are going on. But in a city the item may be a very important one. Geo. W. Tillson believes that in New York's heavily traveled streets no pavement is too expensive which reduces to a minimum the occasions when traffic is interfered with by repairs and renewals. This item it is very difficult to include in a comparison of total costs of pavements, and it is even entirely omitted in many comparisons of relative advantages; but for city streets especially it should not be overlooked.

A related characteristic is ease and rapidity of repairing. That city is fortunate—or moribund—whose pavements are not being opened in patches more or less frequently to give access to sub-surface pipes and structures. This must therefore be expected and anticipated, and due credit be given to that kind of pavement which can be replaced most perfectly and with the shortest period of interference with traffic.

Commission-Manager Plan of Government.

In an address delivered June 3 before the Conference of Mayors of New York State, Henry M. Waite, city manager of Dayton, presented the advantages of the city manager plan of government, which he aptly terms the commission-manager plan. The latter appears to us to be a better name. The manager is the novel feature and it is but natural that emphasis should be placed upon it in naming this form of government; but the commission remains and is the elected body, and the manager is employed by it. There is the vital difference between this and the older commission form, however, that the commissioners do not serve as heads or directors of departments; the executive functions are all exercised by appointees selected each for his special fitness for his particular work, while the commission is a legislative body.

The argument most commonly used for these modern forms of municipal government is that the running of a city is purely a business proposition and should be treated as such. Mr. Waite compares it to the operating of a large railroad. But there is this important difference—very few of those traveling on a railroad are stockholders, while all taxpayers are. If every traveler became a shareholder by purchasing a ticket and had a voice in electing the directors, and was urged to take an interest in the operation of the road, the parallel would be more complete.

Another difference is that the railroad is expected to make a profit, whereas this is not the case with a city government. So important do some consider this difference that they claim that the introduction of the business idea into municipal government has already been carried too far. With this we do not agree, but because of this difference it would seem advisable not to endeavor to copy or adapt commercial forms of control, but to develop others which shall take into consideration the proper relation of the voter and taxpayer to the "business of government."

The WEEK'S NEWS

State Roads in Ohio and Missouri—Street Improvements in Brooklyn, Baltimore and York—Tacoma Mayor Wants Chlorine Plant—Main Bursts in Philadelphia—Prosperous Water Works—New Motor Apparatus—City Manager and Commission Form.

ROADS AND PAVEMENTS

Permanent Roads in Ohio.

Columbus, O.—More than one-third of the 573 miles of state roads built and contracted for during the last seven years in the state of Ohio has been of brick or concrete construction, according to a bulletin of the highway department of the commonwealth just issued. During each of the last two fiscal years, 62 miles of each of these permanent types have been constructed. The city of Bellefontaine, O., laid the first concrete roadway in the country 22 years ago, and it is still giving excellent service. Most of the concrete road in the state constructed in 1912 was given a bituminous wearing surface, such as has been adopted for the trunk line system in California, but the result was not satisfactory in Ohio climate, and the highway department now is building plain, single-course concrete roads. Altogether Ohio has 78 miles of concrete roads, 440 miles of brick roads, 12,000 of macadam, and 15,600 of gravel.

That improvement covering every one of the 9,300 miles of intercounty highways and main market roads in the state be petitioned for by county commissioners and that every dollar available to the state for highway improvement and construction be under contract by the close of 1914 are the two chief aims now of State Highway Commissioner Marker. Much headway has already been made. Out of the total 9,300 miles to be petitioned for, 7,204 have been covered. Sixty-one counties have petitioned for every mile within their boundaries, and 24 counties have petitioned for part of their total mileage. Petitions requesting state aid must be filed with the State Highway Department before January 1. Otherwise the state can take no hand in the improvement of the roads or in building new ones. It will be impossible for the state to build all the roads petitioned for next year or for several more years, but by having all the petitions on file with the State Highway Department much trouble will be eliminated when it does become possible for the roads to be built. The State Highway Department has more than \$2,000,000 worth of construction under contract at this time. Other large contracts will be awarded as soon as plans and specifications can be completed.

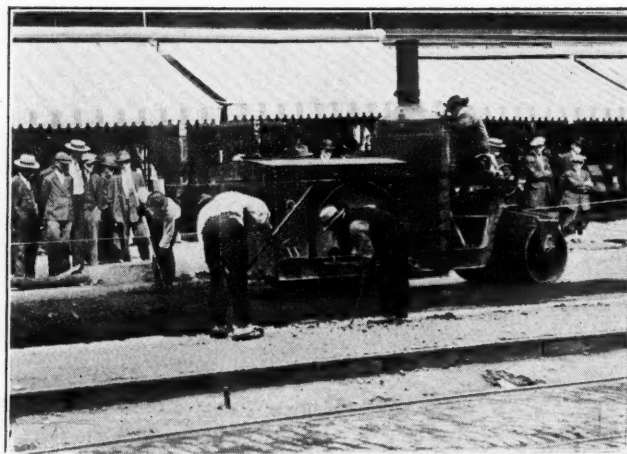
Missouri Roads Unimproved.

St. Louis, Mo.—According to figures obtained from Colonel Henry Buffum, state highway commissioner, Missouri has 117,634 miles of dirt roads, of which 63,370 are wholly unimproved. The improved roads average 54,263 miles. These are either dragged or graded. The state has but 3,420 miles of gravel made roads, 1,417 miles of macadam, 50 of patent surface, 570 miles are of the sand clay surface, and 700 miles of chert; 342 miles of the state's roads are covered with miscellaneous pavings. During the fiscal year of 1913, \$4,755,315 were spent in building and repairing roads and of this amount \$1,913,376 was county court appropriations. The state spent \$112,500 for road dragging; \$387,274 was donated; \$352,739 was appropriated by the road districts, and \$1,692,102 came from the bridge fund of the state. Colonel Buffum said he would urge Governor Major to call two good roads days again this fall.

Brooklyn Street Improvements.

Brooklyn, N. Y.—Among the public improvements authorized, which will be completed this year are new streets, paving, regulating and grading, and sewers in Brooklyn amounting to \$5,096,300. The suburban sections in Brooklyn and Queens will undergo transformation this

season. Sections will be cut into streets, blocks and lots, and the streets regulated and graded. When the financial restrictions caused by the city's close proximity to the debt limit are loosened by the increased borrowing capacity, which will become available later in the year, the Board of Estimate will release additional public improvements, in Brooklyn \$934,000 and in Queens \$3,471,900. The immediate improvements planned in Brooklyn include the laying out, regulating, grading and paving of twenty-seven streets in the new suburban sections. The acquisition of land for a new bank improvement is also planned, as well as land that is still required for bridge approaches on this side of the East River. During the summer forty-five new street systems are to be established in Queens. The sewer system too will be developed on a most elaborate scale in the newly laid out residential sections of the borough. Twelve sewer drainage plans have been prepared and approved by the Board of Estimate. Incidentally the board has also authorized thirty map changes, which are required under the Charter, preliminary to the final authorization of street, sewer, grading and regulating improvements.



Courtesy Baltimore (Md.) News.

IROQUOIS ROLLER AT WORK IN BALTIMORE.

Street Work in Baltimore, Md.

Baltimore, Md.—Approximately 260 men, working in two shifts, are engaged in the beginning of repaving Baltimore street, under specifications of the paving commission. This contract is one of the most important jobs in the history of the paving commission. The specifications call for sheet asphalt from curb to curb in the section of the improvement. A concrete base is required under and around the ties of the United Railways. The work is being done by the Union Paving Company of Schenectady, N. Y., a new concern in the local paving field, and so far the work has progressed faster than any other contract started by the paving commission in the last year. The contract allows the firm 80 working days in which to finish this section of the job, from the time the first old Belgian block was torn up to make way for the new paving. The improvement in this section will cost \$37,400. The paving company is working about 30 men a day, in two shifts, while the United Railways is working about 100 men a day, also in two shifts. Work is also being done in repaving Howard street in the shopping section. The latter is illustrated in the photograph.

Contractors Dislike New Law.

Trenton, N. J.—The contractors on state roads are in a panic because of alleged withholding of moneys by the

state comptroller under the new Requisition Act passed at the last session of the legislature, under which approval must be given by that state official before any work can be contracted for by any state officer. It is said among the contractors that a million dollars' worth of road work has been held up by someone. From the comptroller's office it was stated that orders have gone out to the State Road Department that the practice of "morally approving" roads in advance must stop, and those orders having been obeyed a state of chaos in road building has set in in all of the 21 counties of the state.

Ruling Helps State Roads.

Urbana, O.—Thousands of men will find employment at road construction this year as a result of a ruling by Attorney General Hogan that contracts for road improvements may be made before the money raised for this purpose under the Hite law half mill levy is collected and placed in the state treasury. "This ruling advances the road work of the state one year," said State Highway Commissioner Marker, to whom the opinion was given. Under the law there will be some \$3,500,000 available under this year's levy, but as the money will not be actually in the treasury for several months after the time prescribed by law for the collection of it, the work of letting road contracts would be held up for a long time, if the department was required to wait until all the money was collected before proceeding. The highway department will lose no time in arranging to let contracts.

City and Contractor Dispute Over Salvage.

San Francisco, Cal.—President Reardon, of the Board of Public Works, called on the police to prevent Mahoney Brothers, who are building municipal railway lines, from disposing of the basalt blocks they tore up. The contractors claimed the blocks as salvage, as they are to repave the road with bitumen when the railway is constructed, and they sold them to a street contractor. President Reardon said the blocks belonged to the city and were worth \$6 a thousand at present, as basalt blocks were scarce. He sent teams of the Board of Works to haul the blocks to the reggraded part of Polk street, where they were wanted for paving. A conflict ensued, the purchasing contractor's teams carried off two loads of the blocks and then the police arrived to assist Reardon. He says the blocks in question are worth \$2,500.

City to Make Paving Blocks.

Houston, Tex.—The city of Houston will make its own creosoted wood block for paving purposes if no other means can be found of obtaining better prices on wood blocks. Mayor Campbell is determined to obtain better prices on wood blocks than have been prevailing here. He thinks some of the local lumber companies can be induced to erect creosoting plants and furnish wood blocks to the city as reasonably as it is furnished in other cities, but if this cannot be done the city will probably make its own blocks. Mayor Campbell said he is not in favor of having a municipal creosoting plant unless it is absolutely necessary. Houston paving contractors are paying \$1.85 per square yard for creosote blocks, while in San Antonio the city has purchased the same blocks in large quantities for \$1.20 per square yard. On account of the difference in freight rates Mayor Campbell contends that wood blocks should be 20 cents per square yard cheaper here than in San Antonio.

County Builds 97 Bridges.

Ames, Ia.—Marion and Story counties are having a hot race for the honor of holding first place in the number of new bridges built in 1914. Marion holds the record so far, both in number and in total cost. Marion county in the year let 97 bridges at a cost of \$56,628.86. She will let contracts for 51 more June 4, making a total of 148. Story county at her first letting contracted for a total of 70 bridges, at a cost of \$22,050. Her second letting, scheduled for May 22, called for bids on 69 bridges at an estimated cost of \$30,000, making her total bridge contract outlay \$55,000. These figures do not include the smaller work being done in each county.

"Good Road" Work in Reno.

Reno, Nev.—City Clerk J. R. Parry states that this city has just received several pieces of repair and patching machinery to be used in the repairing of the paved streets. The work has been rushed so as to be completed in time for the automobile race. Reno citizens responded well to Governor Oddie's "good roads" proclamation, and much good work was accomplished.

Amiesite for York, Pa.

York, Pa.—Superintendent of Highways Boyer proposes to use Amiesite to make repairs of the asphalt paving in this city. A carload of the material has been ordered and is scheduled for arrival immediately.

Waste Oil for Streets.

Paulsboro, N. J.—After a successful experiment, the Borough Council has decided to use waste oil from the local gas plant on the roads to keep down the dust. Work has begun, and every street in the town will be oiled. In previous years contracts were made for the oiling of the streets, but Road Supervisor Turner showed how much more economical the waste oil is.

SEWERAGE AND SANITATION

Mayor Wants Chlorine Plant.

Tacoma, Wash.—Returning from an inspection of the Green river watershed, Mayor Fawcett states that he believes a chlorine gas plant will be needed for purification purposes at certain times of the year. The mayor made the trip with Health Officer Wall and Project Engineer Manley. A large part of the watershed was patrolled. He believes the plant ought to be on hand ready to use so we will be prepared if anything happens during the fall months when there is a large amount of surface water. It will not cost anything while it is not being used and no extra help will be needed to operate it. The mayor said Health Officer Wall was to investigate the merits of the chlorine gas plant before it was selected. An ordinance has already been passed by the council appropriating \$10,000 for the construction of a purification plant at the headworks. The money has never been spent, mainly for the reason that the water department has had difficulty making ends meet. A hypochlorite plant to cost \$10,000 was first suggested. Engineer Manley was then sent through the East investigating purification methods and he returned with a recommendation for a chlorine gas plant as cheaper to construct and maintain. A temporary hypochlorite plant is in use now.

Begin on New Sewer System.

Vincennes, Ind.—About 150 men have begun the storm water sewer system that is to be built in the central part of the city. An effort was made to start two forces on the system, but not enough men could be obtained. Several blocks of sewer have been laid and trenching is progressing rapidly. Contractor Quinn is in charge of the work and expects to keep at least 200 men constantly employed all summer. The contract was taken for \$88,000.

To Clean Reservoir Basin.

Nashville, Tenn.—Preparatory to cleaning the west basin of the city reservoir and treating it for rendering it watertight, the basin is now being drained. Removal of the sediment will be commenced next week, and after the basin is cleaned, treatment of it in accordance with plans and specifications prepared by Rudolph Hering, hydraulic engineer of New York, will be begun. In view of the fact that the west basin has not been cleaned since the wall of the east basin broke in November, 1912, and that during most of the time which has elapsed since then the west basin has been exclusively used, it is believed that there is a large accumulation of sediment in it, and it will probably require at least ten days or two weeks to clean it. A complex floor will be laid. Preparatory to constructing the new floor, the old concrete floor, which is 12 to 15 inches thick, will be carefully cleaned. It will then be flushed with cement mortar one inch thick, and this coating will be mopped with hot asphalt cement. On this wall will be

placed alternately five layers of asphalt felt membrane or carpet and asphalt cement. This will be covered with concrete slabs sixteen feet square, the space between the sections being filled with hot asphalt cement. The asphalt carpet will be lapped up three feet on the cement plaster on the wall and the concrete floor slabs will be joined to the wall by means of concrete wedge blocks, sixteen feet long, and breaking joints with the floor slabs. The horizontal member of the wedge block will form a V-shaped trough with the surface of the wall. In the bottom of this trough three inches of asphalt cement will be placed, and the two faces of the trough will be covered with asphalt membrane seven-ply thick, and in it will be cast the vertical member of the wedge block. Below the wedge blocks will be installed tile drain pipes, which will connect with a manhole on the outside of the wall, the pipes and manhole being designed to catch water which may leak from the basin, in the event it should not be watertight, as it is proposed to make it. The walls will be treated with cement by means of pneumatic guns, as were the walls of the east basin. About two months will probably be required to place the new floor and treat the walls as proposed.

State Sues City in Sewage Case.

Harrisburg, Pa.—State Commissioner of Health Samuel G. Dixon has requested Attorney General Bell to begin suit against the borough of Coatesville under the act of 1905 for failing to file plans of the existing system of sewers in the borough and plans for a sewage disposal plant. An outbreak of typhoid fever at Embreeville has been traced to sewage from Coatesville, discharged into Brandywine Creek without treatment.

WATER SUPPLY

Two-Thirds of Philadelphia Without Water.

Philadelphia, Pa.—A huge trunk main bursting at the Lardner Point Pumping Station left hundreds of thousands of homes without water for hours, and during the rest of the day only a scant supply was furnished. Because of the deficiency many factories had to use raw water, and it is feared the mains within the affected district have been infected. The break was about a block from the pumping station. Before the water department employees could get the several valves in the neighborhood closed so as to cut out the broken section the pump pits in the basement of the pumping station were flooded. This put the plant out of commission. Only in the low parts of the city could water be drawn on the second floors of the houses, and in some districts none was obtainable on the first floors. Restoration of the full pressure was prevented by the flooding of the pumping station. Seven fire engines were sent to Torresdale to pump out the basement of the Lardner Point plant, which was submerged in twelve feet of water. The fire engines were supplemented by gasoline engine pumps of large capacity, borrowed from various manufacturing plants. Nearly 500,000 persons were suddenly deprived of water just at a time when it was most needed in homes. Workmen in the basement of the pumping station were nearly caught and drowned, and hundreds of workers in the water department were called out of bed to remedy the trouble. No reason was assigned for the break in the big pipe by Chief Davis, but afterwards a broken T was found near the pump pits. Police were enlisted by the department of public health and the bureau of water to distribute "boil the water" circulars to householders in a territory covering two-thirds of Philadelphia. This precaution was taken to prevent a possible epidemic of typhoid fever. Normal conditions were restored by the next day. A fire during the low-pressure period had to be extinguished by chemical engines.

Waterworks System Completed.

Carlisle, Ky.—The waterworks system which has been installed here, at a cost of \$30,000, work on which has been going on here since March, is now completed. The citizens here are planning for a big celebration.

All-Metering for Schenectady.

Schenectady, N. Y.—A thorough overhauling and re-vamping of methods of the water bureau of the city is proposed. Superintendent McWilliams states that the system in effect is very incomplete and unsatisfactory in many particulars, and that an expert will take charge of things for the purpose of getting a new start very shortly. The reorganization of the financial affairs of the bureau will bring about some radical changes it is thought and included in them will be the placing of the entire city on a meter basis and the establishment of a sliding scale of rates which will materially reduce the cost of water to the vast majority of users. Superintendent McWilliams said that he was considering propositions from two or three expert accountants who are competent to take charge of the books of this bureau and evolve a satisfactory system. When that has been done the meter system will be installed. Schenectady now uses meters in part only and even then a flat rate is fixed on the water. Where meters are used a sliding scale will be placed in effect.

Water Development Successful.

Pasadena, Cal.—The most encouraging news that has come from the water department since the city took over the water system was made when Commissioner Salisbury announced that the water level in the two North Pasadena wells is now six feet higher than it has ever been since the wells were first sunk. This means that the water level at that point is six feet higher than it has been at any time within twenty years, for one of the wells was put down twenty years ago and the other sixteen years since. Commissioner Salisbury attributes the rise to the water developing work which has been done by the city in the upper Arroyo Seco. This work has had for its object the diversion of storm water, which would otherwise have run away over the sunken dam at Devil's Gate. The water was turned out over the sand of the Arroyo and thus percolated into the upper water basin, materially raising the water level there. The rise is in a measure due to the tremendous floods of the past winter. The developing work which has been done has been neither costly nor is it as complete as it will be now that its worth has been proven. The water department was feeling out its way, and now that the plan has worked so well, further efforts along the same line will undoubtedly be attempted as fast as money for the work becomes available.

Water Works Prosperous.

Springfield, Ill.—In view of the large excess of revenue over expense, as shown in the annual audit of the water works department, Mayor John S. Schnepf is considering the introduction into the council of a resolution providing for a further cut in water rates or an ordinance taking immediate steps toward the laying of the new thirty-six-inch main from the water works to the city. The total expense of the department last year was \$59,749.93, while the total revenue was \$143,859.89, leaving an excess of revenue over expense of \$80,307.77. This excess was \$5,000 more than last year. As the last two months of this fiscal year were months when the low water rate was in effect and there was a distinct drop in the water receipts, it is believed that the excess of revenue next year will be nearly as large as this year.

New Water System for Brooklyn, N. Y.

Brooklyn, N. Y.—The water problem in Brooklyn will be solved during 1914 by the improvements to be put into effect by the Department of Water Supply, Gas and Electricity. These improvements are designed to furnish the borough with such increased facilities of water supply that there will be a big drop in the insurance rates in every part of the borough. Mayor Mitchel has just signed an ordinance passed by the Board of Aldermen appropriating the sum of \$1,722,600 to develop Brooklyn's sources of water supply on Long Island, as well as the extension of the high-pressure system, which has proved so efficient in handling big conflagrations. The infiltration gallery system, which will increase the water supply by millions of gallons in Brooklyn, will be developed during 1914 at the cost of \$1,300,000. Until the infiltration system was adopted by the city millions of gallons of water from the heavy

rainfalls were allowed to seep in the ground and go to waste. This rainfall now seeps into these infiltration galleries, which are located at all the principal streams on Long Island which are used for the Brooklyn water supply. For pumping this increased supply of water, Commissioner Williams will award a contract in 1914 for the construction of a new high-pressure pumping station at the Massapequa gallery. The cost will be \$25,000. East New York and the Bedford district will be equipped with new trunk mains to distribute the increased supply of water. These mains will cost \$150,000. Small distributing mains will radiate in every direction from these new trunk mains, extending into the Eastern District, the Park Slope section, the Bedford district, South Brooklyn and the Borough Hall districts. The laying of these small distributing mains will cost \$250,000. The Mount Prospect pumping station at the Willink entrance of the park will be equipped with a new pumping engine at a cost of \$17,600. For fire protection, street sprinkling and other purposes Water Commissioner Williams will spend \$30,000 for the installation of additional hydrants. These extensions of the water system in Brooklyn will provide a supply adequate enough to meet the needs of the development and increased population until the Catskill water supply becomes available to this borough.

Water Supply Dynamited.

Haledon, N. J.—For the second time within two years some one has dynamited the reservoir at Haledon, from which the residents of that borough obtain their drinking water. Hundreds of fish were killed by the explosion, their dead bodies almost entirely covering the surface of the water. The discovery was made in early morning and reported to William Westerfield, superintendent of public works. The task of removing the dead fish was immediately begun. Immediate action was taken in order to avoid the contamination of the water supplying the borough. Mayor Brueckman expressed his indignation and determination to punish the offender to the fullest extent of the law. Last year the reservoir was dynamited just about this season. The reason behind the action is not known.

STREET LIGHTING AND POWER

Power Utilization of Waste Water.

Clinton, Mass.—The billions of gallons of water wasted from the Wachusett reservoir over the spillway at the dam has demonstrated the advisability of a change in the piping at the power house at the dam so that instead of running to waste entirely, the water be utilized for electricity before entering the old river bed. Heavy rains filled the big reservoir to overflowing. The result has been that the quantity of water from the Wachusett reservoir for use by the Metropolitan water district has been limited, thus decreasing the draft on the local reservoir for that use and increasing the quantity necessarily wasted over the spillway. It is planned to have the piping in the power house so changed that, when it is not necessary to send water to Boston by the opening of gates, the waste can be brought through the power house rather than over the spillway.

City to Own Gas Plant.

Rocky Mount, N. C.—With the decision that the gas plant for this city should be of the water gas, low-pressure type which was in accord with the recommendation of the consulting and gas engineers of the city, there has been placed an order for the machinery for the first municipal gas plant in the state. The contract was awarded the Western Gas Construction Company, of Fort Wayne, Ind., at \$21,345.

To Abolish Lighting Arches.

Flint, Mich.—That the antiquated lighting arches have ceased to be ornamental and are becoming dangerous was the assertion made in a report of the lighting committee

at a common council meeting. The committee recommended that a single unit lighting system be installed at the earliest time practicable. The use of the poles of the Detroit United railway as far as possible if their use can be obtained was recommended for the proposed lighting system. It was also recommended that conduits for the laying of wires of the lighting and police and fire signal system be constructed before the new pavement is laid.

Municipality Not Liable.

Madison, Wis.—A municipality, upon taking over a public utility by purchase is not liable on a lease entered into by such public utility with a third party prior to the purchase by the municipality, according to a decision of the Supreme Court. The court held that a lease is not to be considered as property. The decree was in connection with the case of the Green Bay & Mississippi Canal Company against the Kankauna Gas, Electric Light and Power Company.

FIRE AND POLICE

Stubborn Fire in Newburgh, N. Y.

Newburgh, N. Y.—Fire beginning near the roof of a bakery in Beacon resulted in property damage amounting to about \$10,000. After working with five streams for



WEBB ENGINE AT NEWBURGH FIRE.
Courtesy Newburgh (N. Y.) News.

an hour, the Beacon firemen had the flames under control. Chief McNeal and his men did excellent work in preventing the spread of the fire. The auto engine on the job, shown in the illustration, was a Webb Motor Apparatus Company's machine.

Ask for Fire Tug.

Erie, Pa.—The need of the city fire department for a fire tug has again been emphasized by Chief McMahon and Director of Public Safety Dundon. Chief McMahon said that a big fire along the bay probably would sweep the water front from end to end. It would be impossible to use the water from the bay without a tug—there would be no way to reach a blaze on the north side of some of the buildings which face the lake. According to the chief, it would cost the city little more than \$500 a year to maintain a fire tug. Director Dundon said he believes the department should have one, or possibly two such tugs for use in emergency. At one time the city had two fire tugs, but they were dispensed with. They cost \$500 a year each.

Meters For All Fire Hydrants.

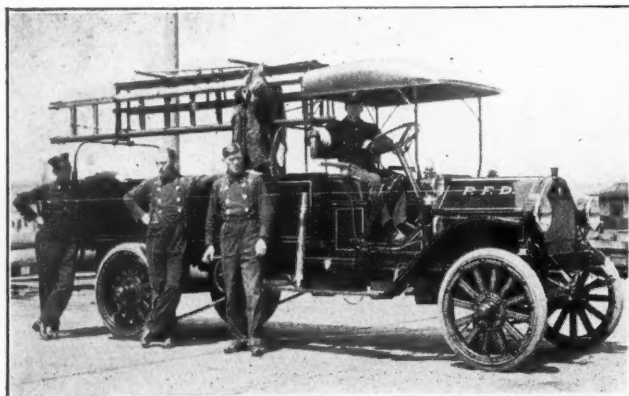
Paterson, N. J.—Mayor Robert H. Fordyce, at a meeting of the board of public works advocated the attachment of meters to all water hydrants in the city. In furthering such action the chief executive stated that he had investigated and learned that of the 1,452 fire hydrants located in the city, 1,000 of these were never used. According to the statement of the mayor the city pays a yearly fee of \$30 per hydrant and he believed the attachment of water meters would mean a saving of \$30,000 per year. President Cooke pointed out to the mayor that heretofore a contract had always been closed with the Passaic Water Company for fire hydrant service, but that this contract was not operative at the present time. President Cooke did not

believe that even though water meters were attached to the hydrants that the cost at the end of the year would be any cheaper. According to the information given by Mayor Fordyce only 452 fire hydrants in the city are used to any extent. It was his view that even though the city had always had a contract they should acquaint the water company with these facts and attempt to secure cheaper service. It was decided to have Commissioner Joseph A. McCrystal take the matter up with the officials of the Passaic Water Company.

MOTOR VEHICLES

Truck As Fireboat Tender.

Portland, Ore.—The recently purchased two-ton Velie has proven itself very useful as a fireboat tender. The city officers recently decided they should have an additional truck in the service, and a committee composed of city



Courtesy Portland (Ore.) Telegram.
VELIE TRUCK AS FIREBOAT TENDER.

engineers was appointed to inspect all trucks on the market. They visited all the garages and examined and tested the various types. Their choice was successful, as the Velie is giving good service.

Five Trucks for Baltimore Contractor.

Baltimore, Md.—Five five-ton Packard trucks have commenced work on the Belair road, near Baltimore. They had been driven under their own power from Bridgeport, Conn., in three days and were ready for business immediately. In a few hours they were hauling six to seven ton loads of sand and gravel for paving work under contract with P. Flanagan & Son and later were hauling asphalt to various points where road work is being done. The trucks are owned by Willett, Rich & Willett, hauling contractors, of Bridgeport, Conn., and are here mainly for hauling work on the Belair road. Willett, Rich & Willett have been running this fleet of trucks about 15 months. Their trucks are equipped with dumping boxes designed by the owners. It is said they can carry a load to the dumping point, dump and be on their way again in two minutes. The illustration shows four of the five trucks.

New Brunswick, N. J., Motorizing.

New Brunswick, N. J.—New Brunswick's Fire Department is gradually becoming motorized and already is prepared with enough of such apparatus to reach any remote part of the city in quick time. With the arrival of the remodeled engine for Phoenix Company No. 3 there will be four motor-driven machines, the others being the combination hose cart and gasoline pumping apparatus of Liberty, the hook and ladder truck, and the recently motorized steamer of Raritan Company No. 4. The latter and the expected Phoenix steamer are now driven by motor tractors, designed and manufactured by the C. J. Cross Company, of Newark.

Dover Purchases Auto Police Ambulance.

Dover, N. H.—The members of the Dover Police Com-

mission have bought a Buick police ambulance car which has just been delivered. The car will be for general utility purposes and will be used by the police department for all sorts of hurry calls and accidents. It will hold about fifteen men. The police commissioners decided to forego their salaries in order to make possible the purchase of the car until it is absolutely all paid for.

Instructing Fire Auto Drivers.

Rochester, N. Y.—Drivers in the fire department are being instructed in ways and means of driving the auto fire apparatus. Instructors are to be here from the plants from which the auto fire apparatus was purchased to give instruction in the handling of the apparatus. The auto fire engine which will soon be responding to alarms from the Exchange street fire house, was made by the Ahrens-Fox Company of Cincinnati, O. The instructor from this company has arrived. The instructor from the Seagrave Company, of Columbus, O., has begun to give lessons. No special time has been fixed for any demonstrations. The truck cost \$10,000 and the engine \$9,000.

GOVERNMENT AND FINANCE

Complete Commission Rule in Oklahoma Cities.

Tulsa, Okla.—With the inauguration in Nowata of the commission form of government, every city in Oklahoma of 4,000 population and over is now under the commission rule. Within five years the change has been made. Tulsa set the pace and in rapid order the larger cities of Oklahoma followed the example. Then the smaller cities took up the idea of changing from the aldermanic to the commission form and one by one adopted the new plan of municipal government. But two attempts, in Enid and in Duncan, have been made to abolish commission charters and in both instances the voters overwhelmingly disapproved it. While no city under the commission rule claims the cost of government is lessened in the least, yet all are unanimously of the opinion that centralizing the responsibility of government in the hands of a few men of experience has in every instance resulted in better conditions in every way than were obtainable under the aldermanic rule. Now the "villages" of Oklahoma, towns of 2,000 population and over, are talking commission government and some of them will make the change before the year ends.

City Manager Plan Adopted.

Roswell, N. M.—After much agitation this city has adopted the city manager plan. W. M. Atkinson, a former mayor, was named as city manager at a salary of \$150 a month. He will act under the mayor and the ten city councilmen.

Pittsburg, Kans.—Mulberry, a city of 2,000 population, fifteen miles north of Pittsburg, is to be ruled by a town manager after June 1. The mayor and council have employed Frank C. Bevans, a mine overseer, to take full charge of the city affairs, including the water and light plant system, which are owned by the municipality. No ordinance providing for the new method has been passed but if the plan works out, as it is hoped, such an ordinance probably will be enacted. Mayor Newton Marion announces that the plan will be given a thorough trial.

Considering Voting Machines.

Watertown, Wis.—That it will furnish voting machines to the city and accept payment from the amounts saved on each election is the proposition of the Automatic Registering Machine corporation, formally made to the city council and now in the hands of the finance committee. One of the machines has been demonstrated in the city clerk's office. The plan proposed for Watertown is that the city shall purchase seven machines, one for each of seven voting precincts, each to be made up of two wards. It is claimed that the total cost, \$4,550, would be saved within the first five years, after which the saving of about \$1,000 a year would be entirely for the benefit of the taxpayers. The company represents that as high as 1,800 voters have cast their ballots on one machine in one day in other cities,

and that with seven machines in the city, there would be less possibility of congestion at the polls than is at present the case.

STREET CLEANING AND REFUSE DISPOSAL

Regulate Refuse Collection.

Paterson, N. J.—By the unanimous vote of the four members of the board of public works the ordinance governing refuse collection was passed. Some time ago when the ordinance was suggested universal opposition made it necessary for Mayor Robert H. Fordyce to oppose the passage of the ordinance at the time. He, however, agreed that it was necessary. The only change from the original ordinance as drafted is Section 4, which provides for the separation of tin cans and bottles. President Charles D. Cooke and the members of the board of public works realize that at this time the garbage and refuse collected in the city is increasing and it will be necessary to put two shifts of men to work at the destructor plant in order to destroy the house waste. Members of the board of works now believe that sufficient time has been allowed for the purchase of cans and it is imperative that garbage and ashes be separated in order that the city destructor plant might be operated successfully and without great cost. Street Commissioner James E. Taylor has attempted to force property and householders to separate their garbage and ashes, although no ordinance warranted this action. The Sanitary company, which corporation makes the collections throughout the city, have informed the board of public works that they will place several additional wagons in service for the collection of tin cans and bottles together with waste paper. The provisions of the ordinance follow:

- 1—Ashes must be entirely separate from all other refuse and contained in a metallic receptacle so constructed as to prevent spilling or leaking of its contents; such receptacles shall be not less than 14 inches, nor more than 20 inches in diameter, and not less than 16 inches, nor more than 26 inches in height.
- 2—Garbage must be kept entirely separate from all other refuse and must be placed in a metallic water-tight receptacle not less than 8 inches, nor more than 18 inches in height; such receptacle shall have a separate cover, close-fitting when in place.
- 3—Paper and other refuse must be secured in packages or in a separate receptacle or receptacles to permit of easy handling and to prevent the contents of the same to be scattered on the street or sidewalk.
- 4—Tin cans and glass bottles shall be placed in another receptacle.
- 5—None of the receptacles above mentioned shall be filled within one inch of the top thereof.
- 6—Any person violating any of the provisions of this ordinance shall upon conviction thereof, be punished by a fine of \$2.

Police Guard Garbage Wagons.

Trenton, N. J.—During the recent strike of garbage-wagon drivers the city garbage was collected with a policeman to guard every wagon. The drivers went on strike because they were not granted an increase of wages by the city commission. Director of Public Safety LaBarre ordered a policeman to accompany each of the new drivers obtained, so there would be no danger of violence. Mr. LaBarre declares that if there is any further trouble he will have the work done by private contract.

MISCELLANEOUS

City Cannot Appropriate for Conventions.

Pittsburgh, Pa.—City Controller E. S. Morrow of Pittsburgh holds that, under the laws of Pennsylvania, the council of any municipality cannot legally appropriate money for conventions that may be held within the city. The issue was raised by the controller when he announced he would not draw a warrant for \$5,000 that council appropriated for the national convention of real estate men. The measure was presented by the Pittsburgh Real Estate Board. Controller Morrow says it will require a mandamus from court to get the money. The point he raises is that the council has no authority to spend the people's money in this way, and that if he paid out the money he and his bondsmen could be held responsible.

Injuries to City Employees.

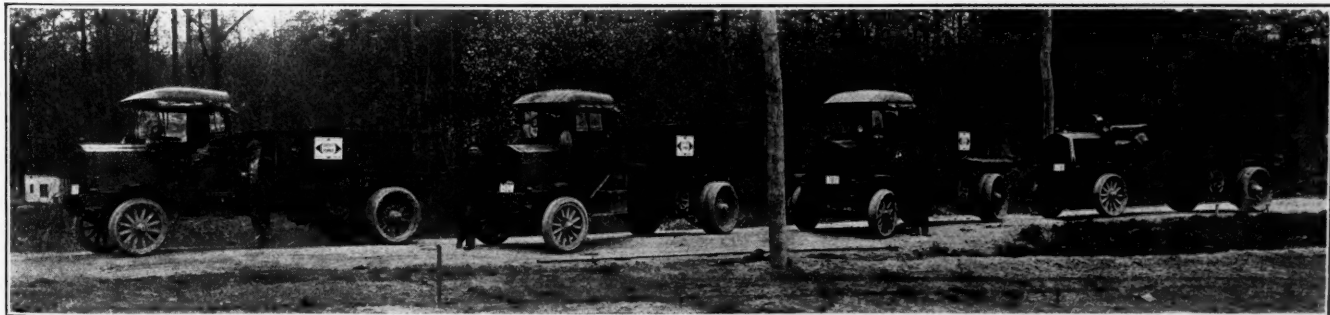
Pittsburgh, Pa.—The question of how far the city should go in the matter of paying city employees for time lost because of injuries received while on duty has been raised by Public Works Director Robert Swan. The director favors the Rauh act, under which city employees are guaranteed their wages at times of the accident, but suggests that the council make some provision for stricter supervision of the operations of the act. Director Swan said that the employee who intends to claim payment for lost time should notify the superintendent of his bureau the very first day he is absent from work. The payments for lost time become burdensome to a city when there is not strict inquiry into the merit of each claim. He suggested that the charities department supply a physician, whose sole duty would be to give immediate attention to all cases of this kind. The council concurred with Director Swan and will provide a physician.

Borough Must Pay Damages.

Aspinwall, Pa.—A jury in Common Pleas Court, Pittsburgh, returned a verdict for \$10,000 in favor of a boy of 17 and his mother. The lad was injured when a chain attached to an electric light belonging to the borough of Aspinwall struck him. He was seriously burned and shocked, and his mother brought suit against the borough.

May Have "Signboard Day."

Baltimore, Md.—City Forester R. Brooke Maxwell has decided to plant trees in front of many of the obnoxious signs he is not permitted to tear down. His move is in co-operation with the plan of State Forester F. W. Besley to rid the entire State, so far as possible, of unsightly signs. Forester Maxwell said that he would aid a plan of State Forester Besley to have June 20 declared "Signboard Day." The day will be declared dedicated to the signboard nuisance that Baltimoreans and Marylanders may have the evil brought more forcibly to their minds. The tacking of signs to trees within the city is prohibited because of the activity of Forester Maxwell in securing legislation against the practice. Major Joseph W. Shirley, chief of the Topographical Survey, has made a study of the signboard evil in the different cities of the country and is also preparing to co-operate with State Forester Besley.



Courtesy Baltimore (Md.) News.

FIVE-TON PACKARDS HAULING ON ROAD CONTRACTS.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Railroads—Conveyances—Rights Acquired.

N. Y. Cent. & H. R. R. Co. v. City of Buffalo, N. Y.—A city conveyed to a railroad company a right of way for railroad tracks, in consideration of a conveyance of real estate by the company to it. The city took possession of the tract conveyed to it, and erected structures for its waterworks system. The city at the time of the conveyance to the company maintained across the right of way tunnels, pipes, and mains forming a part of its system. The city retained possession of the parcel conveyed to it for nearly 30 years, and the railroad company during that time never questioned the right of the city to maintain tunnels, pipes, and mains across the right of way. Held, that the city, though estopped to deny the validity of its conveyance, as not made in conformity to its charter, could not be deprived of its right to maintain tunnels and mains underneath the surface of the right of way and to lay new mains when necessary.—Supreme Court, Equity Term, Erie Co., 147 N. Y. S., 209.

Contracts—Eight-Hour Law—Violation.

Village of Medina, N. Y. v. Dinglestone et al.—The state labor law provides that in the performance of a contract for municipal improvement, eight hours shall constitute a legal day's work, requiring that the contract shall contain a provision that it shall be void unless the contractor shall comply with the act, and declares that no such persons or corporation shall be entitled to receive any sum, nor shall any officer or agent or employee of the state or of a municipal corporation, pay the same, or authorize its payment, from funds under his charge or control to any such person or corporation for work done on any contract which in its form or manner of performance violates the provisions of the section. Held, that where a village made payments to a sewer contractor with knowledge that he had violated the act in the performance of the work, it was not entitled to credit therefor in determining the cost of the improvement after it had taken over the work and completed the same itself, as against the contractor's surety.—Court of Appeals of N. Y., 104 N. E. R., 1118.

Public Improvement—Extras—Contract—Waiver.

Riverside Tp., N. J., v. Stewart.—A provision of a municipal sewer contract that the contractor, in order to receive payment for extra work, must present a bill for extras accompanied by an order in writing from the engineer and the township committee, etc., was one which the township could waive and was waived by direction of the township committee and the engineer, and the contractor at a regular meeting was directed to proceed to include the extras; they saying that "their word was as good as their contract."—Circuit Court of Appeals, 3rd Circuit, 211 F. R. 874.

Acquisition of Waterworks—Form of Question.

Janesville Water Co. v. City of Janesville, Wis., et al.—The question submitted on the ballot in an election to determine the question of municipal ownership of a waterworks, "Shall the city of Janesville purchase the Janesville Water Company?" while inapt because the question intended to be submitted was whether the city should purchase the waterworks system of such company, could not have misled the voters so as to affect the validity of the election.—Supreme Court of Wisconsin, 146 N. W. R. 784.

Civil Service—Employment—Salary.

Gathemann v. City of Chicago.—Where plaintiff was employed, under the civil service law, as a machinist for the city of Chicago, he was a municipal officer, and as such was bound to perform the duties of his office for the salary

attached thereto, and could not legally claim additional compensation for the discharge of such duties, though the salary was inadequate, and this notwithstanding his duties may have been increased by a subsequent statute or ordinance without a corresponding increase in salary.—Supreme Court of Illinois, 104 N. E. R. 1085.

Power to Regulate Sale of Food.

Koy v. City of Chicago, et al.—A municipal ordinance requiring milk pasteurizers to be equipped with a recording apparatus which would make a record in a chamber kept under lock and key in the control of the commissioner of health of the temperature, time of exposure, and quantity of milk exposed at one time was not invalid, though such recording apparatus could be manipulated to make a false record, and though the number of milk dealers and the extent of territory made it physically impossible for the officers of the department of health to visit all places where milk was pasteurized and change the dials of the apparatus between the time of each pasteurization and the next, since these were questions of judgment and discretion; and it was for the city council to determine whether such apparatus would be better than no record at all, or whether officers of the health department should be provided in sufficient number to visit each place between each pasteurization and the next.—Supreme Court of Illinois, 104 N. R. 1104.

Erection of Municipal Buildings—Powers.

Smith, et al., v. City of Raton, N. M., et al.—Under the power granted to cities and towns by subsection 5, § 2402, Comp. Laws 1897, to erect all needful buildings for the use of the city or town, such municipalities are limited to the erection of such needful buildings as may be required for public uses, or for municipal uses and purposes, and contradistinguished from private or quasi-public uses, and, if the primary object of a building to be constructed is a municipal purpose, the fact that it may be incidentally used for theatrical purposes may not have the effect of rendering the action in erecting it invalid; but where the paramount purpose and object is for other than strictly municipal purposes, legislative authority is lacking in this state for the erection of such buildings by cities and towns.—Supreme Court of New Mexico, 140 P. R. 109.

Assessments of Benefits—Estoppel—Interests.

Corey v. City of Detroit, Mich., et al.—A property owner who was agreeable to the improvement of a street, and did not desire to prevent it, but protested that the assessment was inequitable and unjust, and not made on a proper basis, could not, after receiving the benefit of the improvement, defeat so much of the assessment against his property as he ought of right to pay on technical grounds. Where plaintiff, against whom a street improvement assessment was made on an improper basis, did not pay nor tender the amount which should have been assessed for several years, he was chargeable with interest on such amount, as he had the benefit of the improvement during that time, and the somewhat chaotic condition of municipal affairs resulting from the disorganization of the village, and the inclusion of its territory in another village and a city, did not relieve him from liability for interest.—Supreme Court of Michigan, 146 N. W. R. 670.

Taxation—Contract for Discovery of Omitted Property—Collection.

McCaslin v. City of Greencastle, Ind., et al.—A contract whereby a city agreed to pay plaintiff a part of the taxes assessed upon secreted property which he might discover and cause to be entered on the tax duplicate is valid. Where a contract entered into by the mayor of a city to pay plaintiff a percentage of the taxes collected upon secreted property, discovered by him, referred to the municipal ordinance authorizing such contracts, the ordinance became a part of the contract by reference, and the contract is not objectionable as exceeding the authority conferred by the ordinance.—Appellate Court of Indiana, 104 N. E. R. 870.

NEWS OF THE SOCIETIES

Calendar of Meetings.

June 1-3. **NATIONAL CONFERENCE ON CITY PLANNING.**—Annual Meeting, Toronto, Canada. Flavel Shurtleff, Secretary, 19 Congress street, Boston, Mass.

June 1-5. **NATIONAL ELECTRIC LIGHT ASSOCIATION.**—Thirty-seventh Convention, Bellevue-Stratford Hotel, Philadelphia, Pa. T. C. Martin, Secretary, 29 West 39th street, New York City.

June 1-5. **AMERICAN ORDER OF STEAM ENGINEERS.**—Twenty-eighth Annual Convention. Armory, Baltimore, Md.

June 2-5. **WISCONSIN GAS ASSOCIATION.**—Annual Convention, Milwaukee, Wis. Hotel Pfister.

June 3-5. **CONFERENCE OF MAYORS AND OTHER CITY OFFICIALS OF THE STATE OF NEW YORK.**—Fifth Annual Conference Auburn, N. Y. W. P. Capes, Secretary, 105 East 22d street, New York City.

June 15-17. **SOUTHWESTERN WATER WORKS ASSOCIATION.**—Third Annual Convention, New Convention Hall, Tulsa, Okla. E. L. Fulkerson, Secretary-Treasurer, Waco, Texas.

June 23-25. **SOUTH CAROLINA STATE FIREMEN'S ASSOCIATION.**—Tenth Annual Meeting and Tournament, Florence, Ala. R. S. Hovel, Secretary, Sumpter, S. C.

June 23-26. **SOCIETY FOR PROMOTION OF ENGINEERING EDUCATION.**—Annual Convention. Prof. H. H. Norris, Secretary, Ithaca, N. Y.

June 30-July 4. **AMERICAN SOCIETY FOR TESTING MATERIALS.**—Seventeenth Annual Meeting, Hotel Traymore, Atlantic City, N. J. Edgar Marburg, Secretary, University of Pennsylvania, Philadelphia, Pa.

July 3-4. **AMERICAN SOCIETY OF ENGINEERS, ARCHITECTS AND CONSTRUCTORS.**—Midsummer Convention, Brighton Beach, N. Y. T. Hugh Boorman, Secretary, 35 W. 39th St., N. Y. City.

July 17 and 18. **TRI-STATE PACIFIC COAST GOOD ROADS ASSOCIATION.**—Annual Convention, Medford, Ore. George E. Boos, Secretary, Medford.

Aug. 18, 19, 20. **FIREMEN'S ASSOCIATION OF THE STATE OF NEW YORK.**—Geneva, N. Y.

Sept. 11-12. **STATE FIRE MARSHALLS' ASSOCIATION OF NORTH AMERICA.**—Annual Convention, Asheville, N. C.

Conference of Mayors of New York.

This week, on June 3, 4 and 5, Mayors and other city officials of cities in the state of New York are gathering in Auburn for a conference. The headquarters are at the Osborne House.

The program follows:

Wednesday, June 3.

First Session—Mayor Fiske, of Mt. Vernon, presided. Addresses of welcome by C. W. Bristerof, Auburn; President J. J. Irving's address; The Commission Manager Plan—Its Advantages, by H. M. Waite, City Manager of Dayton; The Municipal Home Rule Campaign—the Next Steps, by R. S. Buikerd, City Club of New York; The State and Municipality, by Gov. Glynn.

Second Session—Mayor Burns, of Troy, presided; The Effect of Atlanta's Campaign Against the Segregated District, by J. L. Beavers, Chief of Police, Atlanta, Ga.; Fire Prevention As a Municipal Function, by J. Hammitt, New York Fire Prevention Bureau; Auburn Fire Department Drill.

Thursday, June 4:

Third Session—Mayor Cowen, of Newburgh, presides. Symposium of Municipal Needs; question for discussion by each mayor, "What is the next most important problem your

city must solve?" Review of municipal parade by delegates.

Fourth Session—Mayor Tree, of Ithaca, presides. Parks and Playgrounds—a Program of Development, by C. D. Lay; Making the Survey for a City Plan, by Prof. J. S. Pray, of Harvard; entertainment in prison chapel.

Fifth Session—Mayor Brock, of Lockport, presides. The Relation of the City to Its Employees, by Mayor Mitchel, of New York; What the Conference Tax Survey Shows, by H. L. Purdy, of New York.

Friday, June 5:

Sixth Session—Mayor Lennon, of Yonkers, will preside. An Efficient Municipal Health Program—How the State Will Help, by Dr. H. M. Biggs, State Health Commissioner; Public Health Value—a Few Modern Fallacies, by Dr. D. B. Armstrong, Supt. Bureau Health, New York City.

There will be discussions of addresses at each session.

The conference will close with a shore dinner, to be given by Auburn to the delegates at Koenig's Point.

American Society for Testing Materials.

Though the assignment of papers for the convention of the American Society of Testing Materials, to be held June 30 to July 3, at Hotel Traymore, Atlantic City, is at present provisional, the following program will be observed:

The first session on June 30 will be given over to general reports and to reports of some of the technical committees. The second session of the same day will be on non-ferrous metals. The evening session, or the third session, will be devoted to the annual address of the president, to two technical papers and to a discussion of the present policy governing the adoption of standards by Secretary Marburg.

On Wednesday, July 1, the fourth session will be devoted to steel, and the evening, or fifth session, will be devoted to miscellaneous subjects, but largely steel and iron.

Concrete will be discussed at the sixth session on July 2, and on the afternoon of the same day lime, ceramics and road material will be considered.

Preservative coatings and testing apparatus and methods will be considered at the sessions of the last day.

The committee on nominating officers has proposed the following men: For president, A. W. Gibbs; for second vice-president, A. A. Stevenson; for secretary-treasurer, Edgar Marburg; for members of executive committee, R. Job, F. W. Kelley, A. Marston and S. S. Voorhees.

Massachusetts Street Railway Association.

At a meeting of the association held

on Wednesday, May 20, the mayors of twenty-three Massachusetts cities were guests of the railroad men.

H. H. Crapo of New Bedford, president of the association, was toastmaster, and the mayors at the guest table were: James M. Curley of Boston, John F. Hurley of Salem, Denis J. Murphy of Lowell, Timothy W. Good of Cambridge, George A. Newhall of Lynn, Miram H. Landford of Newburyport, John A. Denison of Springfield, Michael A. Scanlon of Lawrence, James H. Kay of Fall River, Nathaniel J. W. Fish of Taunton, Edwin H. Moulton of Haverhill, Zebedee E. Cliff of Somerville, Benjamin A. Cook of Fitchburg, John H. Woods of Holyoke, Edwin O. Childs of Newton, Charles Schumaker of Malden, Harry C. Howard of Brockton, William H. Feiker of Northampton, Thomas F. Kearns of Waltham, Patrick J. Moore of Pittsfield, Thomas H. O'Halloran of Marlboro, Charles S. Taylor of Medford, Herman A. McDonald of Beverly and Oliver B. Munroe of Melrose.

Mayor Curley of Boston was well received. He commended the meeting as an effort to bring, to all who attended, more light on the subject of street railways and their relations to municipalities, "to the end that better service may be secured for the public, with justice to the men and women who have invested in the stock of such corporations."

Mayor Good of Cambridge spoke words of praise for the excellent service given the people of his city by the Elevated, and Mayor Munroe of Melrose spoke in similar vein of the operation of the Bay State Street R. R. in Melrose. Mayor Dennison of Springfield told how the executive officers of Springfield who have to do with the streets meet at luncheon once a month and confer with the street railway officials and officers of other public service corporations that use the streets and there lay out co-ordinate work in advance with resultant better service and less expense to all concerned.

Mayor Feiker of Northampton urged the street railway men present to visit the western part of the state and look over the hill towns trolley problem, with a view of going on with the work that the New Haven R. R. had planned to do.

Southwestern Electrical and Gas Association.

The convention of the association began in Galveston, Texas, on May 20 and ended on May 23. The first session was opened by an address by President Cleffers of Fort Worth. This was followed by a report from Secretary Cooper, which showed that every operating interurban in the state was a member of the association. Likewise gas companies and private light and power plants of considerable size have also enrolled in the membership.

The subjects discussed on the afternoon of May 20 were: "The Economy of Current Use in Street Railway Ser-

vice," by George G. Morse, superintendent of railways, El Paso Electric Railway Company. "Single Car" vs. "Trailer" Operation; "Near-side" vs. "Far-side." "Stops With Rear Entrance and Exit Cars, the Total Advantages and Disadvantages." "The Advantages and Disadvantages of the Small Car Wheel," namely the 24 and 28-inch variety, the safest type of the rear entrance pay-as-you-enter car; gates vs. doors on vestibules, the objections and advantages of each.

On Tuesday the ranks of the delegates were swelled by several hundred new arrivals who were particularly interested in the address of Mr. H. T. Edgar on "Power Plants and Transmission Lines in this Section of the Country."

The Wednesday session was occupied by several important papers such as "Organization in the Small Public Utility Plant," by Jas. R. Kennedy, secretary and manager of the electric and ice plants of Brenham; "Public Policy of Public Utility Corporations," by F. R. Slater, general superintendent of the Texas Power and Light Company of Dallas, and "What Is the Best Course to Pursue under the New Employers' Liability and Employees' Compensation Law?" which was discussed by two members of the board of the Texas Employers' Insurance Association, created by the law itself.

During the evening there was a monster parade. There were large electrical displays, floats and music.

The convention wound up its affairs on Thursday, May 23, by electing the following officers: President, D. Fisher, assistant manager of the Northern Texas Traction Company, Dallas; first vice-president, W. L. Wood, Jr., general manager Southwestern Gas and Electric Company, Texarkana; second vice-president, G. W. Kellogg, Jr., manager Eastern Texas Traction Company, Beaumont; third vice-president, F. R. Slater, general superintendent Texas Power and Light Company, Dallas; secretary, H. S. Cooper, Dallas; treasurer, J. B. Walker, Dallas.

Engineers' Society of Western Pennsylvania.

Sir William Willcocks, builder of the great barrage on the Nile at Assuan, in an address before the Engineers' Society of Western Pennsylvania, at Carnegie Institute May 13, said Pittsburgh must build great walls along its river front for protection against the disastrous floods that occur nearly every year. He denounced the proposed flood reservoirs for impounding waters at head streams and tributaries. Unless these are kept constantly empty, he said, in readiness for every heavy rain they were useless. Speaking of the Mississippi, Sir William said the ancients would have built dikes in the 34,000,000 acres of natural basins in the Mississippi valley, and would have turned the surplus waters into them. While this would convert vast tracts into lakes he explained that only a small part of the land is cultivated and is in a primeval state.

International Association for Testing Materials.

Prevost Hubbard, Assoc. Am. Soc. C. E., in charge Division of Roads and Pavements, The Institute of Industrial Research, Washington, and lecturer in highway engineering chemistry at Columbia University, and Arthur H. Blanchard, M. Am. Soc. C. E., consulting highway engineer, and professor in charge of Graduate Course in Highway Engineering at Columbia University, have been elected by the Council of the International Association for Testing Materials the American members of Commission No. 58 on "Standardization of Methods of Testing and Nomenclature of Road and Paving Materials."

American Institute Electrical Engineers.

The annual meeting and election of officers of the Lynn (Mass.) section of the American Institute of Electrical Engineers was held on May 22 in the General Electric Company's office on Center street, West Lynn. The retiring secretary-treasurer, John A. McManus, Jr., rendered a financial report, which showed that the receipts of the section last year, including balance on hand from previous years, was approximately \$2,600. Balance on hand at the present time, including sinking fund, \$1,047. Present membership includes 116 national and 514 local members, a gain over the previous year of 118, or about 15 per cent.

The outgoing chairman of the section, E. R. Berry, gave a brief talk concerning some of the principal activities of the season just closed.

The election of officers resulted as follows: W. H. Pratt, chairman; F. S. Hall, secretary-treasurer; executive committee, G. N. Chamberlain, chairman; A. H. Barrett, F. J. Rudd, C. H. Stevens, E. R. Berry; entertainment committee, F. H. Bowman, chairman; R. C. Rogerson, E. J. Wilson; membership committee, J. M. Davis, chairman; A. J. Cart, A. S. Walker, W. A. Carter, W. E. Greenleaf, J. H. Kimball, G. E. Sanford, W. B. Taylor, I. W. Phillips, H. J. Menges, J. F. Dubois, S. A. Wallace, A. K. Warren.

Following the business meeting, Fred M. Kimball, head of the motor sales department of the General Electric Company, gave a most interesting illustrated lecture on Mexico.

American Road Builders' Association.

The association will, as recently announced, hold its next annual congress and exposition in Chicago, Ill. Before, however, deciding the question, the Executive Committee made a canvass of the claims of the leading cities of the United States. The selection of Chicago was made because of that city's transportation facilities—which permit delegates from every part of the United States to reach it easily and quickly—and because of its facilities for the holding of a great national convention and exhibition.

After a most thorough investigation of the relative merits of the Coliseum

and the International Amphitheater, the latter was decided upon as being better suited to the requirements. The dates fixed upon for the meeting are Monday, Tuesday, Wednesday and Thursday, December 14, 15, 16 and 17, these dates being selected as the only ones available in that month which would give ample time for the installation of exhibits.

The International Amphitheater is situated on South Halsted street, and extends from 42d street to 43d street. It is within twenty minutes' ride from the downtown or "Loop" district of Chicago and may be reached by six surface car lines and the Stock Yard branch of the elevated railway. The facilities afforded for accommodating under one roof, both the sessions of the convention and the exposition machinery, materials and methods, are ideal in practically every respect. There are available between 75,000 and 100,000 square feet of exhibition space all on one level in the main building. The floors are of concrete with no basement underneath and will carry almost any load, thus making possible the display of the largest and heaviest machinery. A railroad track runs directly into the building, so that if desired, exhibitors may have shipments sent from any point outside of Chicago directly to the Amphitheater. The building has practically unlimited electric power, which will enable exhibitors to show their machinery in operation. The hall in which the sessions of the convention will be held is on the second floor, where machinery in operation and other noises from the exhibition will not interfere with the proceedings. The structure is well lighted and heated throughout.

While the plans for the Eleventh Annual Convention and the Sixth Good Roads Show have not, of course, been completely worked out at this early date, the managers believe that the meeting will not only include the greatest exposition of machinery, materials and methods of road and street construction and maintenance ever made, but will also be the greatest meeting of men directly connected with the construction of roads ever held in the world. The programme will be so arranged as to bring together the leading authorities and experts on road building in the United States and Canada. It is also planned to make the exhibition of the greatest educational value, and to this end there will be introduced features which will be of very great interest and practical value to delegates and guests. The exhibits will include those of the different states and of leading cities, besides many engineering and scientific schools and colleges.

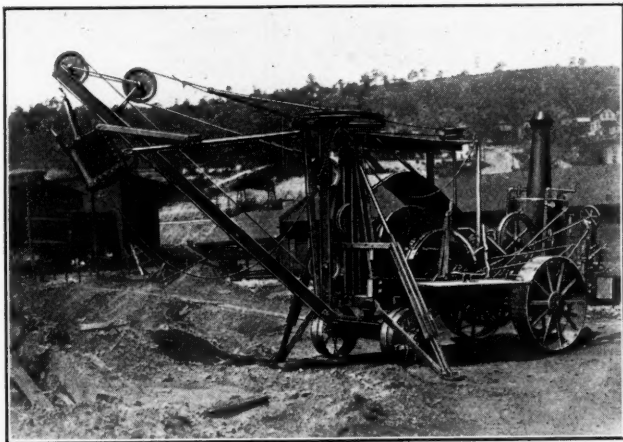
The officials of the Association having the matter in hand express themselves as highly gratified by the enthusiasm for the meeting evinced by leading citizens and public officials of Chicago and by the state highway officials, not only of Illinois, but of other states, and especially those near Illinois.

NEW APPLIANCES

KEYSTONE TRACTION DIRT LOADER.

Light, Portable Combination Steam Shovel, Dirt Loader and Ditcher.

This light dirt loader is designed to fill the contractor's need of a portable steam shovel and may be used in three capacities—as an excavator, as a dirt loader and as a ditcher, using the three different scoops shown in the illustra-



KEYSTONE TRACTION LOADER EQUIPPED WITH DIPPER SCOOP (ELEVATED).

tions. As a tractor it has two speeds—one and three miles per hour—and can go under its own power any place which can be reached by a dump wagon and team. On city streets the removable cleats may be taken off, leaving a broad, flat tire. This makes it possible to use the machine as a road roller in paving.

The scoop—which is in three types—has a capacity of two-fifths of a yard and may be filled, raised and dumped in about half a minute in the regular run. The dipper scoop is designed for digging into a side hill embankment and operates about like an ordinary steam shovel. The skimmer scoop is for shallower cuts from 6 inches to 4 feet and is best for street grading and shallow excavating. The design of the scoop results in a smooth, level finish for the ditch. This scoop may also be used for refilling. The ditching scoop may be used for excavating ditches for sewers, water mains, etc. It will give a ditch from 15 inches to 44 inches wide and 6 to 8 feet deep. With this scoop S. B. Markley, of Woodlawn, Pa., on a contract at Conway, Pa., made a record of 400 feet of ditch 5 feet deep and 36 inches in eight hours.

Under ordinary conditions only one man is needed for operation, but if the loading is continuous, two men are needed. With the dipper scoop the best record has been 142 loads, 1½-yard dump wagons being filled in 6½ hours. The boiler is 36x69 inches of the cross tubular type—described as a

quick steamer, economical of fuel and requiring few repairs. The engine is 8 by 8 inches, is controlled by a governor and does not require the operator's attention once the machine has got to the job. The whole outfit is very light, weighing only 16,000 lbs.

This excavator and loader should certainly become a popular general utility machine for contractors on street paving work, ditching for sewers

200. However, good pavements were known to exist that did not conform at all to the formula. The success of the bitulithic pavement, although a graded pavement, showed that the accepted grading for aggregates could be changed with good results in the most radical way. The success of various penetration methods of paving tended further to the belief that prevailing theories of grading needed revision. Some persons have even gone to the extreme view that almost any mineral aggregate, like the dirt on ordinary roads, could be made into a serviceable pavement by suitable treatment—principally by varying the proportion and viscosity of the asphalt radically from the practice hitherto prevailing.

During the past decade a number of pavements by a variety of methods and under different trade names have been more or less successfully constructed out of certain natural soils. The Petrolithic pavement may be mentioned as one of these.

However, in the fall of 1912 there was constructed in the city of Iola, Kan., on Colborn street, of natural soil and bitumen, a type of pavement which in the judgment of a competent expert promises to play an important part in the field of bituminous road and pavement construction. The street was examined in September, 1913, by A. W. Dow, of Dow and Smith, chemical engineers, New York City, to whose report we are indebted for much of the information in this article. The pavement referred to was built by the Bituminized Road Company of Kansas City, Mo., and has been given the trade name "National Pavement."

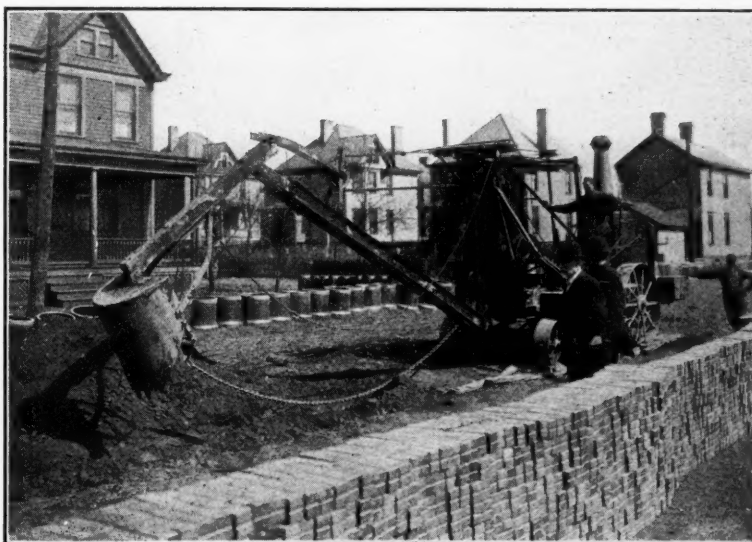
The soil of Iola is what is known as gumbo, an alluvial deposit of argillaceous and silicious elements. The asphalt cement was very soft, about 150

and water mains and general excavating and filling jobs.

NATIONAL PAVEMENT

Soft Asphalt Cement—Earth Foundation.

Some years ago the belief was current that a successful asphalt pavement must be made of a definitely graded aggregate in which the proportions of the sizes of materials vary in approximately regular way from coarse to fine—from material retained on a 20-mesh sieve to material passing



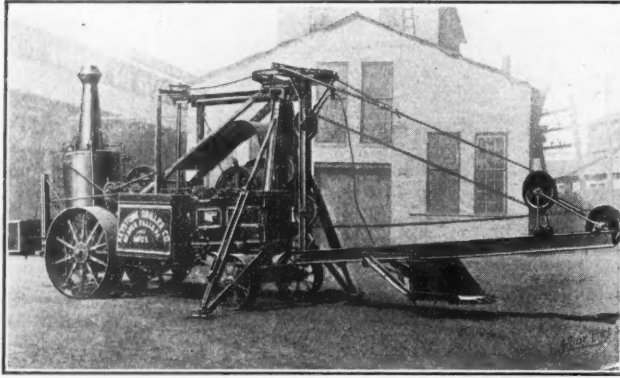
KEYSTONE LOADER WITH DITCHER SCOOP.

penetration and about 16% of it was used in the mixture. The soil was dug up from the streets and fed into a special portable machine, something like an asphalt mixer, which heated and disintegrated the soil. The asphalt was added and the mixing done in an ordinary pug mill mixer. The mixture was spread on the graded and rolled

is highly commended by the officials of the administration and contracts for eighteen more blocks (seven of these now finished) have been made. Mr. Dow believes that the National Pavement will go a long way towards solving problems of highway construction owing to the economy it effects in using cheap materials and that it will

prove durable under city traffic.

A new machine for laying this pavement is now under construction after plans of M. A. Popkess of the National Pavement Company of New York City, which is designed to do the heating, pulverizing and mixing in one cylinder. This calculated to augment the economy of National Pavement.



KEYSTONE LOADER EQUIPPED WITH SKIMMER SCOOP

roadway and compacted by tamping.

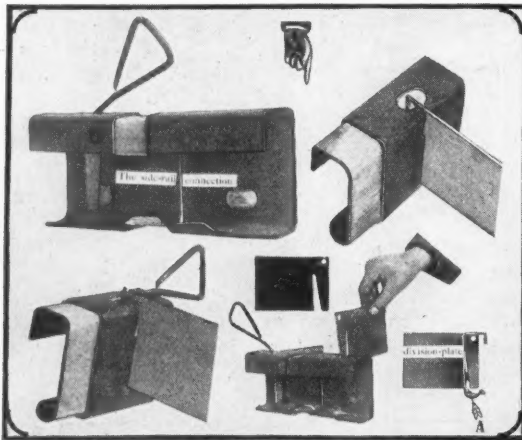
The unusual softness of the asphalt cement and the quantity used, the mixture being a firm pavement is the feature which seems most surprising. This, Mr. Dow says, is due to the strong affinity for bituminous materials like asphalt cement preserved by the colloidal silica and silicates contained

TEMPLET FOR GRADING STREETS.

A templet has been invented by T. Keith Legare of Columbia, S. C., to be used for setting grade stakes in the grading of roadways, thus doing away with a large part of the work of the engineer; since the templet, when once set for a given crown and width, can

be used by any intelligent foreman for this purpose. The templet consists of a beam, on the upper surface of which is set a level for leveling the same; to which beam are attached a number of gauges which slide vertically and can be fastened at any position; the number of these gauges which the inventor prefers being five. Each

gauge is provided with a slot extending nearly its entire length, and through each slot and the beam passes a bolt with a washer, by which the gauge is fastened at the desired position. Each gauge carries along one edge a scale divided into inches and fractions thereof, and is held in a vertical position by passing through guides attached at equal intervals to one side of the beam.



ADJUSTABLE STEEL FORMS SHOWING PARTS.

in clay and clayey soils and also to the firm state of division of the pulverized clay. Continuing Mr. Dow states that soft cement means long life, provided it is not so soft as to roll under traffic. Owing to the fineness of the material, the ordinary wear is likely to be very slight as the ordinary pulverizing and disintegrating process cannot take place. Further describing the physical properties of the pavement, it is stated to be smooth and affording little traction resistance. At the same time it is noiseless under the hoofs of horses and sounds soft although it does not mark nearly as badly as does a street asphalt pavement under the same temperature conditions. The pavement

The use of the templet will be self-evident to any one familiar with the work. For a street of average width, the templet would have a length equal to half the width of the roadway, and the gauge at one end would be set at zero, while the scale on that at the other end would be set at a reading equal to the crown of the roadway. The intermediate gauges would then be set at the calculated distances by which the surface of the cross-section falls below the crown elevation for each point respectively. It then becomes necessary for the engineer to set only one line of stakes in either the center or the curb line of the roadway; or, if the curbs have been set accurately to grade, the gauge at the outer end of the beam may be set to rest upon the top of the curb. With one end of the beam thus fixed in elevation and the beam leveled, stakes can be driven so as to come flush with the bottoms of the other gauges. The photograph shows one of these gauges being used in this way.

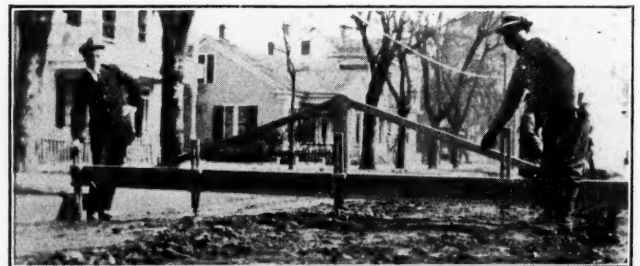
STEEL CURB, GUTTER AND SIDEWALK FORMS.

Adjustable Forms for Concrete Work.

The W. B. Jones Boiler Co., Streator, Ill., is making, under the Heltzel patents, steel forms for concrete work. The sidewalk forms consist of rigid side rails 6, 9 and 12-foot lengths with curvilinear openings in top flange for



ADJUSTABLE STEEL FORM FOR CONCRETE SIDEWALKS.



LEGARS TEMPLET FOR GRADING.

holding division plates at intervals of one foot. The rails are 4 and 5 inches deep and the flanges 2 inches wide. Flexible rails and rigid adjustable rails for telescoping the regular rails without the use of wood are also made. Curb and gutter forms are of similar construction with 3-inch flanges and division plates made to any cross-section specified. The division plates do not project above the top of the side-rails or outside. The side-rails have three right-angle bends which give rigidity. The illustration shows the cross-section of rail, side-rail connection and division plate and the sidewalk form complete.

EXHIBITS AT FOREST PRODUCTS EXPOSITION.

New York City, May 21-30, 1914.

The principal exhibits of municipal interest were those of wood-blocks for paving, creosoting of paving-blocks and the use of wood fibre in the manufacture of fibre conduits.

American Wood Preservers Association.—Creosoted wood paving blocks and piles of all kinds of wood: Tama-

rack, elm, beech, maple, yellow pine, Douglas fir, eastern and western hemlock.

Examples of Kreolite Log Blocks (Jennison-Wright Co., Toledo, O.), models of pavements and photos of block streets, literature and statistics.

Barrett Manufacturing Co.—Creosoting material, analysis, diagrams of plant and process; photos of paved streets. Creosoted conduit made by **Wyckoff Pipe and Creosoting Co.**, of New York.

Carbolineum Wood Preserving Co.—Specimens of wood preserved showing durability and age. Samples of material and photographs.

Redwood Exhibit.—Large diameter wood stave pipes.

Southern Yellow Pine Manufacturers' Association.—Examples of use of yellow pine.

U. S. Forest Products Laboratory.—Government exhibit. Model of cylinder wood preserving plant; treated paving blocks, illustrating effect of treatment on amount of bleeding and proper and improper treating; samples of commercial wood preservatives; specimen of Fibre Conduit.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago quotations: 4-inch, \$26; 6 to 12-inch, \$24; 16-inch and up, \$23.50. Birmingham quotations: 4-inch, \$20.50; 6-inch and up, \$18.50. New York: Considerable private buying in progress and competition keen. Quotations: Carload lots of 6-inch, from \$20.50 to \$21 per ton.

Lead.—Quotations: New York, \$3.90; St. Louis, \$3.80.

Goodrich Wireless Truck Tires.—In the May 14th issue of Municipal Journal appeared an advertisement of the Goodrich Wireless Truck Tires, which mentioned the American-LaFrance Truck used by the city of Jacksonville, Fla. In the advertisement the capacity of the truck was given as 18 tons. This should have been "8 tons."

Wagon and Truck Loaders.—In the new catalog of portable wagon and truck loaders of the Link-Belt Company (Philadelphia, Pa.) are described different types of loaders which may be used in loading sand, gravel, stone and similar loose materials from ground storage. These may be used in street and road construction, especially type "T" portable wagon loader—designed particularly for handling sand and gravel. It is equipped with the swivel chute for loading either side or front at 7½ ft. from the ground. The self-propelled wagon loader is constructed for handling all kinds of loose material and has a propelling mechanism for driving, a swivel spout and special chain and buckets, depending on the material to be handled such as stone, gravel, sand, cement, rock or clinker. It is claimed that the Link-Belt loader will load at the rate

of sixty tons an hour and will load a five-ton auto truck in less than five minutes. These loaders have been used satisfactorily by many contractors.

Contractors' Machinery.—In their latest price list the Walter A. Zeilner Supply Co., St. Louis, Mo., offers a varied line of contractors' supplies and machinery. The list includes buckets and cranes, conveyors, crushers, hoisting engines, tanks, concrete mixers, pipe, asphalt plants, dump wagons, rollers, scarifiers, steam shovels, trenching machines—all of standard makes. A complete contractors' outfit consisting of two traction engines, twelve reversible dump wagons and an asphalt plant is also offered.

The Kindling Squeegee and Sand Spreader.—The Kindling Machinery Co. of Milwaukee, Wis., has issued a new bulletin describing their Squeegee Street Washing Machine and their Sand Spreader. An interesting feature of this catalog is the results of official street cleaning tests in Washington and New York. These tests show convincing records for the Kindling machine. In New York it was found that the Squeegee uses 0.11 to 0.12 gallon of water per square yard and cleans areas varying from 20,000 to 75,000 sq. yds. per day. In Washington, D. C., a gang of 1 sprinkler and 4 Squeegees operated over 2,005,000 square yards for 16 hours each day and each Squeegee averaged 64,212 sq. yds. per eight-hour day. The streets were found to be satisfactorily free from dust. The cost of operation was 0.1162 per thousand sq. yds.

Cast Iron Pipe in 16-Ft. Lengths.—The American Cast Iron Pipe Company, of Birmingham, Ala., has placed on the market 16-foot lengths of c. i. pipe which they claim will effect a great saving to buyers. This, the manufacturers say, is due to the fact that as compared with 12-foot pipe by using the 16-foot lengths there is a saving of one joint in every 48 feet of pipe and hence less weight. In lead and jute the saving is said to be one-fourth.

NEWS OF THE SOCIETIES.

(Continued from page 834.)

International Conferences on City Planning.

The International Conference on City Planning opened in Convention Hall at the University of Toronto on May 25th and closed on May 27th. This conference was held under the patronage of H. R. H. Duke of Connaught, who opened it with an address of welcome.

The principal speakers on Monday, May 25th, were R. S. Gourlay, who spoke on "Basic Principles of Waterfront Development, as Illustrated by the Plans of the Toronto Health Commissioner;" A. W. Crawford, of the Philadelphia bar, who spoke on "Certain Aspects of Municipal Financing and City Planning;" and Secretary Shurtleff, who made an address on "The Progress of the Year in City Planning."

Among the speakers at Tuesday's sessions were L. Veiller, secretary of the National Housing Association, New York City; H. W. Habbars of Harvard; Dr. C. Hodgett, medical adviser of the Conservation Commission of Canada; G. T. Hewitt of London and Dr. F. Nadeau of Quebec. The English view of the Canadian financial situation was given when Mr. Hewitt joined in the discussion on some aspects of municipal financing. He bluntly declared that the first thing that struck him when he first came to Canada was the absolute lack of control of municipal expenditure, and ventured the opinion that the time had gone by when the municipalities were going to get their money at the cheap rate hitherto prevailing. He advocated the adoption of a local government board, and stated such would have a tremendous effect in re-establishing Canadian credit in England. Hon. George Langley, Saskatchewan, had something to say in a different vein about Canadian municipal indebtedness. He declared that so far as his knowledge went, there had not been a single case of default in meeting liabilities. He was of the opinion that they had not borrowed nearly so much as they should have borrowed, and with regard to the local government board suggestions, pointed out that such had already been established in Saskatchewan.

The last day's sessions were devoted to addresses on rapid transit. In his address on rapid transit and the motor bus, John A. McCollum, assis-

tant engineer of the Board of Estimate and Apportionment of New York City, held that motor busses in cities are a good supplement to existing rapid transit lines. "The three thousand motor omnibusses on the London, England," he said, "are now carrying an aggregate of about 500,000,000 passengers per annum, a total greater than the number of cash fares collected on all the street surface railways of the boroughs of Manhattan and the Bronx in the City of New York. George A. McAneny, president of the New York Board of Aldermen, said the street railways favored congestion, as it increased their profits.

Flavel Shurtleff of Boston was chosen secretary, San Francisco, Baltimore, Cincinnati and Detroit all have made requests for next year's session. The meeting agreed to leave the matter in the hands of the executive committee.

City Marshals and Chiefs of Police Association of Texas.

The twentieth annual convention of the association took place in San Antonio, Texas, from May 26 to May 28.

About one hundred delegates were present, on the morning of May 26, at the Gunter Hotel to hear Mayor C. G. Brown, of San Antonio, deliver an address of welcome, in which he called attention to the contemplated improvements to be made in the San Antonio police department. Following the mayor's address, Mr. Kirkpatrick, president of the Publicity League, and Alderman S. B. Weakley spoke. President Sallis and former President H. Barren, of Waco, responded. In the afternoon the chiefs were entertained by a trip to the "Cradle of Texas Liberty" and to Ft. Sam Houston.

At the morning session of the second convention day it was decided, following a suggestion by G. A. Smith, of Dallas, to ask the state legislature that police affairs be taken out of politics and be placed on a strictly civil service basis. Addresses were given by Chief of Police Davidson of Houston, Chief Ryan of Dallas, Chief Montgomery of Fort Worth, Chief Perrett of Galveston and Police Commissioner Davis of Fort Worth. The afternoon was occupied by a business session and the evening by special entertainment at Luna Park.

On Thursday the delegates heard the report read by Secretary Newby, after which the following officers were elected: President, W. S. Knight of Corsicana; first vice-president, J. E. Whitley of Honey Grove; second vice-president, George A. Smith of Dallas; third vice-president, O. H. Montgomery of Fort Worth; sergeant-at-arms, John W. Ryan of Dallas. Patrick Henry Wheeler of San Antonio was re-elected mascot and C. W. Newby of Fort Worth as secretary.

The 1915 convention will meet in Ft. Worth.

PERSONALS

Cedar Key, Fla.—At the election held recently the following candidates were elected: D. A. Andrews, mayor; J. E. Watson, marshal; N. B. Fletcher, clerk and assessor; A. P. Schlemmer, treasurer; J. W. Turner, B. C. Wadleigh, Fred Whotman, H. E. Charpia, aldermen. All were elected by a big majority.

Ormond, Fla.—The town election here resulted as follows: Mayor, W. F. Colby; aldermen, J. A. Reilly, G. A. Daub, Thomas Wingate; clerk, D. W. Waldron; treasurer, C. M. Geiger; tax collector, Fred Carnell; assessor, D. W. Waldron.

Arkansas City, Kan.—S. K. Titus has been re-appointed city engineer for a term of two years, having already filled two terms.

Mt. Sterling, Ky.—M. J. Goodwin was elected city engineer to succeed W. A. DeHaven.

Salina, Kan.—These officials have been chosen by Mayor Niquette: City attorney, H. C. Tobey; city clerk, C. E. Banker; city engineer, P. G. Wakenhut; street commissioner, A. Olson; city marshal, H. Burke.

Elkton, Md.—In the recent municipal election, W. Don Price was chosen mayor; H. W. Pippin, J. H. Reynolds, T. W. McKenney and C. S. Boulden, town councilmen.

Chicago, Ill.—Thomas O'Conner is now fire marshal of Chicago.

Portland, Ore.—L. S. Kaiser has been appointed superintendent of the city water bureau and V. G. Chessman is chief clerk.

Klamath Falls, Ore.—Thomas F. Nichols was recently elected mayor and H. L. Levitt and J. W. Liemens were re-elected police judge and city treasurer respectively.

Nowata, Okla.—The commission form of government having been elected, the following commissioners were appointed: Delos Miller, commissioner of public welfare; D. A. Dye, commissioner of public property; Plez Thompson, commissioner of finance.

Deadwood, S. D.—Mayor N. E. Franklin has announced these appointments: City auditor, K. W. Trimble; attorney, N. T. Mason; engineer, F. S. Peck; physician, Dr. F. S. Howe; chief of police, E. McGinley; policeman, Sherman Reese.

Miller, S. D.—Mayor Ghrist has appointed the following city officers: Chief of police and street commissioner, Wilson; attorney, F. R. Fisher; auditor, T. O. Teller; assessor, Porter Cree; city engineer, C. C. Campbell; fire warden, Vern Danberg; water commissioner, Ed Corrin.

Randleman, N. C.—James C. Daniels was elected mayor and the following

were chosen aldermen: J. T. Millihan, T. A. Compton, A. B. Beasley, S. W. Swain, John O. Ferguson, F. P. Prevo, John J. Newlin, W. F. Matthews.

Superior, Wis.—The city commissioners have appointed the following officers: H. V. Gard, corporation counsel; T. L. McIntosh, assistant corporation counsel; R. E. McKeague, city clerk; George W. Kane, city treasurer; W. J. Patterson, city comptroller; Wm. Tiedman, city assessor; E. B. Banks, city engineer; Dr. C. M. Gould, health commissioner; J. A. Little, city statistician; J. C. Stewart, secretary board of public works.

Irvington, N. J.—Irvington has passed recently from government under the old town form to that of commission rule. The five commissioners who assumed the reins of government are William L. Glorieux, who was chosen mayor; Mahlon Stockman, who was elected commissioner of revenue and finance; Leonard Setaro, commissioner of public safety; Harry J. Stanley, in charge of the department of streets and public improvements, and David H. Greene, commissioner of parks and public property.

The following appointments were made by the commission: Town attorney, W. Eugene Turton, salary \$1,200, extra fees for making tax searches and \$25 allowed for attending court in matters relating to the municipality; town clerk, John W. Wehman, salary \$1,500; building inspector, Joseph Sonnenberg, salary \$1,400; superintendent of streets and sewers, Jonah Hardgrove, salary \$840; assessors, C. William Pfeil, chief clerk, salary \$1,500; assistants, Joel P. Martin and Edward R. Folsom, salaries \$300 each.

Syracuse, N. Y.—Emil M. Kotz was unanimously elected president of the Syracuse Park Commission and H. W. Jordan and D. B. Woodford were chosen commissioners.

Pooleville, Md.—The following commissioners were recently elected: Dr. B. W. Walling, I. R. Hall, L. R. Cruitt, H. W. Spurrier and H. L. Willard.

Barnesville, Md.—These commissioners were chosen: C. C. Hilton, A. C. Jones and C. R. Darby.

Rome, N. Y.—Mayor H. C. Mialam has selected Leon V. Jones as member of board of water and sewers commissioners.

The following mayors have been recently elected:

Basin, Wyo.—James A. Barry.

Nevada City, Nev.—N. W. Rohr.

Conover, N. C.—S. S. Rowe.

St. Paul, Minn.—Irwin Powers.

Klamath Falls, Ore.—T. F. Nicholas.

Petersburg, Va.—Robert Cabaniss.

Home, La.—Enos C. McClendon.

Mansfield, La.—J. B. Elam.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
R. I.	Newport.....	June	6..2,680 sq. yds. macadam, 2,735 lin. ft. concrete curb and gutter, 2,380 sq. ft. granolithic walk, etc.....	Navy Dept., Wash., D. C.
Minn.	Plummer	2 p.m., June	6..Excavating for road construction.....	E. C. Havik, Town Clk.
Ind.	Scottsburg.....	2 p.m., June	6..Constructing gravel roads in several townships.....	Scott Co. Supv.
Minn.	Spooner.....	June	8..Grubbing and grading 3 miles.....	A. Johnson, Town Clerk.
O.	Bremen	June	8..12,000 sq. yds. brick pavement.....	City Clerk.
O.	Lancaster	June	8..Paving with brick, curbing and draining.....	E. A. Hufford, City Clerk.
Va.	Roanoke	June	8..Improving portions of streets with concrete, macadam and bituminous macadam; also granolithic sidewalks.....	City Clerk.
Miss.	Houston.....	12.30 p.m., June	8..Grading and graveling 8.75 miles road.....	Board Co. Comrs.
Cal.	Sacramento.....	11 a.m., June	8..9.9 miles grading; 27 miles concrete road.....	Cal. Highway Commission
Pa.	Oil City	June	8..9,000 sq. yds. brick, asphalt block, or bituminous concrete paving, 7,100 ft. concrete curb and gutter, and 1,600 ft. sewers	B. B. Webber, City Engr.
N. Y.	Albany.....	1 p.m., June	8..Paving with various materials in several counties.....	J. N. Carlisle, Comr. Hwys.
N. J.	Metuchen	8 p.m., June	8..15,000 ft. of 2-inch bluestone flagging.....	C. B. Carman, Hono. Engr.
S. D.	Yankton.....	8 p.m., June	8..Constructing sidewalk	J. W. Somers, City Aud.
Conn.	Meriden.....	June	8..Wood block, brick and concrete on several streets.....	Board Pub. Wks.
Miss.	Houston.....	June	8..Grading and graveling 18 1/2 miles road.....	Co. Comrs.
Ida.	Boise.....	10 a.m., June	8..Sand, clay, earth and gravel roads in several counties.....	State Highway Commission
Mo.	Sikeston.....	8 p.m., June	8..12,000 sq. yds. of brick on conc. 5,500 ft. curb & gutter.....	E. L. Barker, City Engineer
Pa.	Johnstown.....	5 p.m., June	8..Paving and curbing in 14 streets.....	H. H. Crazier, Supt. of Hwy.
N. J.	Camden.....	11 a.m., June	8..Supplying trap rock, 400 ton stone, placing same as rip ran and concrete arch and culvert.....	J. J. Albertson, City Engineer
Minn.	Wadena	10 a.m., June	8..Grading and grubbing road.....	I. J. Cottrell, Clerk.
Minn.	Detroit	2 p.m., June	9..Work on various roads, including grading, culverts and ditches	W. J. Morrow, Co. Aud.
Mo.	St. Louis	Noon, June	9..Constructing road consisting of vit. brick on concrete, also granite curbing	Board of Pub. Imps.
N. Y.	Ballston Spa.....	June	9..Constructing vit. brick pavement.....	W. H. Lawrence, Vil. Clk.
Ill.	Chicago	11 a.m., June	9..Furnishing about 125,000 repressed vit. brick.....	L. E. McGann, Comr. Pub. Ser.
O.	Cheviot	Noon, June	9..Macadamizing and otherwise improving streets.....	A. J. Rausing, Vil. Clk.
D. C.	Washington.....	June	10..Repairs to asphalt pavements.....	District Comrs.
Mich.	Beulah.....	June	10..Constructing one mile state road.....	Highway Comrs.
N. J.	Long Branch.....	11 a.m., June	10..Improving bridge and approach.....	J. M. Corlies, Dir.
Minn.	Anoka	2 p.m., June	10..6,400 cu. yds. of surfacing.....	A. A. Caswell, Co. Aud.
N. J.	Paterson	8 p.m., June	10..Macadamizing several streets, 60,000 sq. yds.....	R. P. Zoerner, Twp. Engr.
R. I.	Woonsocket.....	7.30 p.m., June	11..Building surface water drain	C. W. Mills, Engineer.
D. C.	Washington.....	10.30 a.m., June	11..Material for oil handling plants, including pumps, heaters, valves, etc.	Maj. F. C. Boggs, Gen. Pur. Off.
Ill.	Oquawka	2 p.m., June	11..Constructing levee on two rivers and four ditches. (See proposal ad.)	Isthmian Canal Comm.
O.	Cincinnati.....	Noon, June	12..Repairing county pike	Comrs. Henderson County.
Tex.	Temple	10 a.m., June	12..Constructing about 115 miles gravel road.....	Co. Comrs.
O.	Cincinnati.....	Noon, June	12..Constructing culvert	Belle County Comrs.
N. D.	Sherbrooke	2 p.m., June	12..26 miles of road construction.....	Board Co. Comrs.
O.	Delaware	10 a.m., June	13..Grading, draining and paving	G. J. Mustad, Bd. Supr.
Ind.	Indianapolis.....	10 a.m., June	13..Gravel road	F. C. Higley, Co. Supv.
Minn.	Hastings.....	June	13..15 inches of clearing, etc., and 1,000 cubic yards graveling.....	W. T. Patten, Auditor
O.	Newark.....	June	13..Grading and macadamizing road.....	Co. Auditor.
O.	Cleveland.....	10 a.m., June	13..Improving one road.....	County Commissioners
Okla.	Collinsville.....	4 p.m., June	15..34,000 sq. yds. sheet asphalt, asphaltic concrete or brick.....	E. G. Kraus, Clerk of Board
N. J.	Westfield.....	June	15..Improving sections of streets.....	City Commissioners
Ind.	Battle Creek.....	10 a.m., June	15..Improving one highway	A. W. Var, Twn. Engr.
Wis.	La Crosse	2 p.m., June	15..Improving two streets	H. Guthrie, Co. Aud.
Ky.	Lexington.....	June	15..Constructing roads with asphalt macadam, brick and concrete; cost, about \$200,000.....	Board Public Works.
O.	Antwerp	June	15..3/4 mile brick and concrete pavement, cost \$38,000.....	J. W. Guyn, Auditor
Tex.	Waco	10 a.m., June	15..Constructing five roads and five bridges.....	T. C. Banks, City Clerk.
Tex.	Harlingen	June	15..182,000 sq. ft. sidewalk; 21,350 ft. curb and 9,500 ft. curb and gutter	W. T. Lockwood, Co. Aud.
Ill.	Elgin	June	15..Paving with asphaltic concrete, 30,000 sq. yds.....	City Clerk.
Ala.	Mobile	Noon, June	15..20,400 sq. yds. 2-in. asphaltic concrete pavement on concrete base, 14,200 ft. of granite curbing.....	M. H. Brightman, Engr.
Ind.	Vincennes	3 p.m., June	15..Constructing cement sidewalks, combined curb and gutter.....	W. Smith, City Engr.
Pa.	Kittanning	8 p.m., June	15..3,500 ft. concrete curb and gutter, vit. block pavement; 3,800 sq. yds. &c.....	Board of Public Works.
Wis.	New London	8 p.m., June	17..Constructing cement sidewalks for 1914.....	O. S. Geiger, Clk. of Council.
Wis.	Green Bay	10 a.m., June	16..Constructing large amount of sidewalks.....	C. J. Thompson, City Clk.
Pa.	Harrisburg	10 a.m., June	16..Paving with various materials in several towns.....	D. J. Deyer, Ch. Com. on Sidewalks.
Ky.	Versailles.....	7.30 p.m., June	16..6,000 sq. yds. vit. brick pavement on concrete.....	State Highway Dept.
Ill.	Breeze	8 p.m., June	17..Cement sidewalks and crossings. (See proposal ad.)	City Clerk
O.	Cincinnati.....	June	19..Repairing one road.....	C. C. Eulberg, City Clk.
Pa.	Reading.....	11 a.m., June	19..Paving with several materials on several streets. (See proposal ad.)	A. Reinhardt, Clerk
O.	Toledo.....	10 a.m., June	21..Repairing road with Bermudez asphalt.....	J. H. McConnell, Supt.
Tex.	San Antonio	4 p.m., June	22..Paving certain streets, about 890,000 sq. yds. in area. (See proposal ad.)	P. J. Sanzenbacher, Aud.
N. J.	Elizabeth	June	22..Constructing brick pavement, flagging and curbing, etc.....	Fred Fries, City Clk.
O.	Antwerp	June	23..Paving one street.....	W. P. Neafsey, St. Comr.
O.	Marion.....	June	30..Constructing several pavements and walks.....	Village Clerk.
N. J.	New Brunswick	July	6..Paving one street	H. C. Cass, Director
Minn.	Shakopee.....	10 a.m., July	13..Road culverts	City Clerk.
				A. J. Meyer, Co. Auditor

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE				
O., Kenmore	Noon, June	6..Laying vitrified and cast-iron pipe.....	J. F. Nice, Mayor.
S. D., Britton	8 p.m., June	8..Sewer system and sewerage treatment plant; about 25,000 ft. 8-15-inch pipe.....	City Auditor.
Conn., Southington	8 p.m., June	8..66,400 ft. 8 to 20-inch vit. pipe sewers; 5,100 ft. 8 to 20-inch c. i. pipe.....	Sewer Commissioners
R. I. Woonsocket	2 p.m., June	8..Constructing 5,800 ft. 5-inch and 425 ft. 15-inch sanitary sewer, and two sand filter beds.....	C. W. Mills, City Engineer
O., Columbus	June	9..Constructing several storm sewers.....	Director Public Service.
Conn., Bridgeport	June	9..Constructing intercepting sewer.....	City Engr. Terry.
N. D., Fargo	5 p.m., June	9..Constructing 12-inch lateral sewer.....	A. R. Watkins, City Aud.
R. I., Woonsocket	2 p.m., June	9..Building about 5,800 ft. of 8-inch and 425 ft. of 15-inch sanitary sewer and appurtenances, and constructing two sand filter beds.....	Bd. of Sewer Comrs.
Wis., Cornell	1 p.m., June	10..Constructing sewers and appurtenances.....	G. C. Borland, Vil. Clerk.
N. Y., Brooklyn	11 a.m., June	10..Constructing storm water sewer; total cost about \$81,000.	L. H. Pounds, Boro. Pres.
Pa., St. Marys	June	10..200 ft. storm water drains, inlets and 400 ft. sanitary sewer.....	W. G. Banner, Ch. Burgess.
Iowa, Fort Dodge	1.30 p.m., June	12..About 825 ft. tile drain, intakes, etc.....	L. J. Hanrahn, Co. Auditor
Cal., So. Pasadena	noon, June	13..Constructing complete sewer system to cost \$200,000.....	B. V. Garwood, Clk.
Cal., Pasadena	About June	14..Various sewer improvement, cost \$10,000.....	R. V. Orbison, Dep. City Engr.
Ill., Elgin	June	15..36,000 ft. 6 to 15-in. sewer.....	M. H. Brightman, Engr.
Wis., Kenosha	2 p.m., June	15..500-foot 15-inch vit. pipe sewer.....	Street Assessment Com.
Ala., Mobile	Noon, June	15..Storm sewer, about 19,500 ft., sizes from 6 to 24-in., including 36 manholes, 60 inlets and 12 basins.....	W. Smith, City Eng.
Kan., Independence	June	15..Five blocks of 8-inch pipe sewer.....	T. H. Kriehagen, City Clk.
N. J., Milltown	2 p.m., June	15..Furnishing labor, material, etc., for sewerage system, consisting of 8 miles vit. pipe, sewage pumping station, etc.....	R. A. Harkins, Boro. Clk.
Pa., Plains	7.30 p.m., June	15..Sewerage, grading, paving, etc.....	W. Rowlands, Sec. Bd. Comrs.
S. D., Tripp	July	15..Constructing sewer system and sewage treatment plants.	Dakota Engrg. Co., Mitchell.
Ia., Bettendorf	June	15..Sewer system amounting to \$34,000, including septic tank, pipe from 8 to 18-inch.....	City Clerk.
M. Wh. Sulphur Spgs.	8 p.m., June	15..Sanitary sewer system and disposal plant.....	G. Wallwork, Town Clerk.
Minn., Winona	June	15..Sanitary sewer in four streets.....	City Clerk.
O., Akron	June	16..Sewage treatment plant.....	I. A. Priest, Clerk
N. J., Newark	2 p.m., June	16..Main intercepting sewer in Paterson.....	Passaic Valley Sewer Comrs.
O., Akron	June	16..Sewage treatment plant.....	Director Public Service.
N. C., Washington	June	17..Constructing 8 miles sewer and furnishing motor-driven centrifugal pump.....	Committee on Imp.
La., New Orleans	June	17..15-ton hand operated crane, and constructing of drainage canal.....	F. S. Shields, Sec.
S. D., Britton	8 p.m., June	18..Complete sewer system, including sewage treatment plant.	G. G. Baker, City Aud.
Neb., Norfolk	About June	25..Storm sewer; cost, \$2,000.....	H. H. Tracy, City Engr.
N. J., Newark	2 p.m., June	25..Constructing Part 9 of main intercepting sewer.....	Passaic Valley Sew. Comrs.
WATER SUPPLY.				
Mass., Chelsea	11 a.m., June	6..Heating and pumping plant.....	H. R. Stanford, Chief Bur. Yds. & Docks, Wash., D. C.
O., Glendale	Noon, June	8..Extending height of standpipe 30 ft.....	Trustees of Public Affairs.
Ill., Cicero	8 p.m., June	8..Laying water supply pipes in two streets.....	C. Jepsen, Pres. B. L. I.
N. D., Williston	8 p.m., June	8..Constructing filtration plant, water tower, tank; also installing two centrifugal pumps.....	E. G. Harvey, County Aud.
Pa., Pittsburgh	June	9..Furnishing and laying 48-inch steel riveted pipe.....	R. Swan, Dir. Dep. P. W.
S. D., Veblen	June	9..Constructing water works.....	City Auditor.
Va., Emporia	June	10..Installing steel tower and tank, 200,000 gals. capacity.....	R. F. Whitaker, Sup. W. W.
Wis., Appleton	9 a.m., June	10..Constructing steel tank and tower; capacity, 500,000 gals.; cost, \$25,000.....	F. L. Williams, City Clk.
Cal., Los Angeles	June	10..Water tank and tower.....	Board Harbor Comms.
Ill., Chicago	11 a.m., June	10..Placing water service pipes in several streets.....	Board Local Imp.
D. C., Washington Barracks	June	12..Furnishing motor-driven centrifugal pumps.....	Lieut.-Col. J. E. Kuhn.
Minn., Waterville	8 p.m., June	12..Putting in water works system.....	A. W. Knaak, City Clk.
N. J., Milltown	2 p.m., June	15..Constructing water works, consisting of 4.5 miles c-i pipe, 4 to 10-inch.....	R. A. Harkins, Boro. Clk.
N. Y., St. Johnsville	June	15..Concrete reservoir with million gallons capacity.....	Board of Comms.
Ont., Toronto	June	16..One or more 24,000,000-gal. centrifugal pumps and engines.....	Chmn. Board Control.
D. C., Washington	2 p.m., June	17..Installing automatic sprinkler equipment in land office, etc.....	L. C. Laylin, Asst. Sec. Int.
Md., Baltimore	June	17..Constructing superstructure for buildings for water department.....	Board of Awards.
N. C., Washington	4 p.m., June	17..Constructing water works and electric plant.....	Com. on Imps.
Ia., Burlington	June	17..Dredging and pipe laying for 30-inch c. i. intake pipe.....	Water Company
N. Y., Sidney	about July	1..Constructing water works, cost \$125,000.....	Village Clerk.
S. D., Tripp	July	15..Sewers and sewage treatment plant.....	Dakota Engrg. Co., Mitchell
LIGHTING AND POWER.				
N. Y., Brooklyn	June	8..Installing electric light equipment in P. S. No. 48.....	Supt. School Bldgs.
Ill., Chicago	11 a.m., June	9..Furnishing 700 angle reflectors; 700 No. 1385 lamp guards; 500 straight reflectors, and 500 No. 1386 lamp guards.....	Ray Palmer, Comr. Gas & E.
D. C., Washington	2 p.m., June	10..One universal high power milling machine, motor driven.....	District Comrs.
Tenn., Chattanooga	10 a.m., July	10..Street lighting for optional period.....	J. H. Warner, Comr.
N. Y., Albany	June	10..Electric wiring and fixing hoist in the Assembly Chamber.....	Trustee Pub. Bldgs., Executive Chamber, Capitol.
Cal., San Francisco	June	10..Furnishing and installing lighting fixtures in sub-treas.....	Supv. Arch., Wash., D. C.
Pa., Williamsport	noon, June	10..Lighting contract, optional period. (See Proposal Ad.).....	S. C. Stabler, Supt. Pub. Wks.
Minn., Minneapolis	June	10..Furnishing and installing special lighting fixtures in post office.....	Supv. Arch., Wash., D. C.
B. C. Kelowna	June	11..Vertical two-crank steam engine, air pump condenser, generator, exciter, etc.....	City Clerk.
Minn., St. James	June	12..Electric work, heating and plumbing in school building.....	Board of Education.
D. C., Washington Barracks	June	12..Motor driven centrifugal pumps.....	Lt. Col. J. E. Kuhn, U. S. Engr.
Tex., Ft. Bliss	June	15..Addition to electric lighting system.....	W. E. Hunt, U. S. A., El Paso.
D. C., Washington	June	16..Supplying three electric furnaces, induction motor, 6,000 ft. conductor cable, 148,000 ft. of insulated conductor, etc.....	Bureau Accts. & Supplies, Navy Dept.
Man., Winnipeg	11 a.m., June	30..Switchboard and other apparatus for fire alarm office equipment.....	City Electrician
O., Mansfield	m., July	1..Electric street lights for 10 years.....	O. Hursh, Dir. Pub. Serv.
Ia., Dubuque	July	2..Providing changes in plumbing cond't and wiring system.....	Superv. Arch., Wash., D. C.
FIRE EQUIPMENT.				
Cal., South Pasadena	June	8..Furnishing motor combination pumping engine and hose wagon.....	M. E. Wolff, Chief.
Pa., Wilkensburg	June	11..Motor aerial truck.....	Borough Clerk.
Ariz., Phoenix	June	15..Three combination chemical and hose motor trucks with equipment.....	W. A. Farish, City Mgr.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
D. C., Washington	...	10 a.m., June 16	Furnishing quantity of hose	Bureau of Supplies, Navy Dept.
Alt., Edmonton	...	June 18	Furnishing one motor combination chemical and hose; 2 motor combination chemical and hose; 1 motor civil service truck; 500 ft. of hose, etc.	City Comrs.
La., Washington	...	8 p.m., June 19	1,000 ft. 2½-in. 3-ply multiple woven fibre fire hose	F. P. Martin, Mayor.
La., Baton Rouge	...	June 25	Furnishing motor combination chemical and hose	A. Grouchy, Comr. Pub. Health
BRIDGES.				
Wash., Ritzville	...	June 6	Constructing four concrete bridges	Co. Comrs.
Ind., Williamsport	...	June 8	Constructing 131-foot span reinforced concrete bridge	Board Co. Commrs.
Ida., Boise	...	June 8	Constructing bridges and culverts	T. Turner, Chr.
Minn., Detroit	...	2 p.m., June 8	Constructing two concrete bridges	C. J. Kuehl, Clerk.
N. J., Trenton	...	2.30 p.m., June 9	Constructing concrete culvert and retaining wall	Chosen Freeholders, Mercer County.
N. Y., Westfield	...	2 p.m., June 12	Reinforced concrete arch bridge	H. W. Thompson, Town Clk.
O., Cincinnati	...	June 12	Constructing culvert	Board of Comrs.
Wyo., Sheridan	...	10 a.m., June 13	Constructing reinforced concrete bridge	C. R. Wood, City Engr.
Ind., South Bend	...	June 15	Constructing reinforced concrete bridge	Comrs.
O., Gilead	...	June 19	Constructing two 82-foot bridges	Co. Commrs.
N. Y., New York	...	11 a.m., June 23	For construction of reinforced concrete Ashokan bridge	Comrs. of Wat. Sup. Board
MISCELLANEOUS.				
R. I., Newport	...	11 a.m., June 6	Concrete float and wooden brow	H. R. Stanford, Chief Bur. Yds. & Docks, Wash., D. C.
N. J., Trenton	...	June 8	Supplying in large quantities automobile identification markers	J. H. Lippincott, Comr. Motor Vehicles.
N. J., New Brunswick	...	2 p.m., June 8	Remodelling and extending court house	City Clerk.
N. J., East Orange	...	8 p.m., June 8	Maintaining scavenger system and disposing garbage	L. E. Rowley, City Clk.
D. C., Washington	...	June 8	Furnishing 185 snubbing posts, complete with anchor	Gen. Pur. Officer, Isthmian Canal Comm.
Mass., Lawrence	...	10 a.m., June 8	Constructing a police station and municipal court building	E. J. Wade, City Clk.
Ill., Chicago	...	11 a.m., June 9	Constructing platforms, grading, ladders, etc., for pumping station	L. E. McGann, Comr. Pub. Ser.
Ill., Chicago	...	Noon, June 9	Erecting complete natatorium buildings	L. E. McGann, Comr. Pub. Ser.
N. Y., New York	...	12.15 p.m., June 9	Constructing part Seventh Avenue subway	Pub. Serv. Comm., First Dist.
N. Y., Binghamton	...	June 10	Constructing dike to cost \$70,000	City Clerk
Del., Wilmington	...	11 a.m., June 10	Excavating and constructing county building	New Castle County B. Comm.
Ill., Chicago	...	11 a.m., June 11	Steam power piping	L. E. McGann, Comr. P. Ser.
Ill., Chicago	...	11 a.m., June 12	Furnishing 12 steel dump cars	L. E. McGann, Comr. P. S.
Ill., Springfield	...	June 15	Erecting buildings and state institutions, also plumbing heating, etc.	D. K. Whipp, Fiscal Supv.
Man., Winnipeg	...	June 15	Street name posts and name plates	Chr. Board Control.
Ky., Jackson	...	3 p.m., June 17	Constructing complete post office. (See Proposal Ad.)	O. Wenderoth, Supv. Arch., Wash., D. C.
Mass., Boston	...	3 p.m., June 25	Mechanical equipment of immigration station. (See proposal ad.)	O. Wentworth, Sup. Arch., Wash, D. C.

STREETS AND ROADS

Decatur, Ala.—Number of streets will be paved in Decatur this summer. Ordinances for paving have just been passed by Decatur city council. Estimated cost of total amount of paving is \$149,000.

Gadsden, Ala.—Between 4 and 5 miles of streets in Gadsden will be treated with oil to abate dust nuisance.

Alameda, Cal.—Comr. of Streets W. J. Baccus of Oakland has notified former Mayor E. K. Taylor of this city that Oakland is about to begin work of improving 23d Ave.

Oakland, Cal.—City Council has directed City Engineer to prepare proceedings for improvement of Peralta Ave., from Hopkins St. to southern line of Morgan property.

Redwood City, Cal.—To insure completion of highway through San Mateo county by 1915 Board of Supervisors has voted for \$125,000 worth of State highway bonds.

Richmond, Cal.—Cutting boulevard, the great 110-ft. crosstown thoroughfare of this city, is to be paved with bitumen from Richmond Ave. to San Pablo Ave. The City Council, on petition of property owners, has ordered work, and paving will commence as soon as contracts can be let.

Richmond, Cal.—Last right of way for state highway down bay shore into Richmond have been obtained by Supervisor Warren M. McBryde from owners of Garrity ranch, and work on boulevard will be commenced shortly. Supervisors are preparing to call for bids for first section from county line to Pinole.

Sacramento, Cal.—Bids will be opened by State Highway Commission for 80.8 miles of road construction in Tehama, Solano, Marin, Santa Clara, Kern, Humboldt, Tulare and Los Angeles counties. Following are stretches on which bids will be received: Humboldt County, from Dyersville to Shively, about 7.3 miles in length, to be graded; Colusa County, from Hershey to Berlin, about 10.8 miles in length, to be built of Portland cement concrete; Solano County, from Fairfield to Vacaville, about 8.8 miles in length, to be built of Portland ce-

ment concrete. Tulare County, from Tulare to Tagus Siding, about 4.3 miles in length, to be built of Portland cement concrete; Los Angeles County, from Liebre Mountain to the northerly boundary, about 12.7 miles in length, to be built of Portland cement concrete; Tehama County, from Red Bluff to the northerly boundary, about 13.7 miles in length, to be built of Portland cement concrete; Solano County, from Benicia to a point 2½ miles south of Cordelia, about 9.0 miles in length, to be built of Portland cement concrete; Marin County, from Larkspur to Sausalito, about 6.0 miles in length, to be graded and part surfaced with gravel; Santa Clara County from Gilroy to Sargent, about 6.0 miles in length, to be built of Portland cement concrete; Kern County, from Sections 5 and 6 to Bakersfield, about 13.0 miles in length, to be built of Portland cement concrete.

Stockton, Cal.—Bond issue is being discussed for purpose of improving many of streets of city.

Bridgeport, Conn.—Board will spend \$200,000 this season on permanent paving.

Springfield, Ill.—Edwin H. White, county superintendent of highways, and Fred Tarrant, engineer for state highway commission, have completed checking of proposed hard roads in Sangamon county, in which list of culverts, drains and bridges needed were made. Improvements to be made this summer in roads include 7½ miles of hard road in addition to several miles of country paving. Bids for improvements will be made in June.

Sterling, Ill.—City attorney has been instructed to prepare ordinance covering paving of 6th Ave. from 13th St. to city limits. Distance to be paved is 1,320 ft., city paving one-half of street and township the other, contract to this effect having been made with highway commissioners several months ago. Estimated cost of city's proportion is \$4,155.30.

Hartford City, Ind.—The viewers and engineer on Monroe St. Rd. have filed their report with County Auditor recommending to Board of Commissioners that road be paved with brick. Highway is almost 3 miles in length and estimated cost is \$86,977.15, brick pave-

ment alone costing \$51,683.80.

Muncie, Ind.—Number of petitions calling for street and alley improvements have been passed and City Engineer Deardorff has been instructed to draw up plans and specifications for their construction by special committee of council. Petitions passed provide for following improvements: For paving of West Gilbert St. from High to Liberty; for improvement of Franklin St. from north line of Washington St. north to south line of Gilbert St.; for improving of Gilbert St. from west line of High St. west to west curb of Liberty St.; for construction of cement alley between Grant St. and Ohio Av. from Main to Jackson St.

Princeton, Ind.—Issue of \$35,000 of Barton township gravel road 4½ per cent. bonds have been sold to Miller & Co., of Indianapolis.

Shelbyville, Ind.—County Treasurer McDonald has sold county road bonds to amount of \$20,620, successful bidder being Fletcher American National Bank, of Indianapolis.

Terre Haute, Ind.—Early returns on election in Harrison Township for improvement of eleven roads, indicate the proposal carried on all roads by majorities of about 4,000 in heavy vote. Improvement covers about 27 miles to be paved with reinforced macadam.

Harlan, Ia.—Harlan's city council has voted four to one to construct 25 blocks of paving with intersections this summer and contracts for work will be let soon. Streets to be paved are all in residence section of city and new paving goes on Durant, Victoria and Market Sts. Number of alleys in west section of town will also be paved.

Leavenworth, Kan.—City Engineer Franks has been instructed to proceed immediately with preparations for paving alleys between 4th and 5th Sts. and Miami and Osage Sts. and 7th St. and Broadway and Cherokee and Delaware Sts.

Whitesburg, Ky.—At next term of Letcher Fiscal Court arrangements will be completed for calling of election to vote \$186,000 in bonds for building of system of good roads throughout county.

Baton Rouge, La.—Bids will be received by president of police jury, Baton Rouge, La., up to June 25, 1914, for

\$186,000 5 per cent. 27-year, good road serial bonds, series "B" of Road District No. 2 of parish of East Baton Rouge. F. A. Woods is Secy.

Haverhill, Mass.—City Engineer Lawton has completed survey of Came Ave. and Hope Ave. and has prepared plan for inspection of City Council. City engineer has also completed plans for laying out and acceptance of part of Colby St.

Beatrice, Neb.—Beatrice has voted bonds in sum of \$50,000 for construction of about 4 miles of additional paving in residence portion of city.

Grand Island, Neb.—Resolution has been passed authorizing clerk to advertise sale of 30 paving bonds in sum of \$500 each, amounting to \$15,000 or as much as may be necessary, to pay for intersections on 3d St. paving. Ordinance creating paving district No. 12, consisting of that portion of East 2d St. from east line of Sycamore St. to east line of Plum St., has been passed.

Atlantic City, N. J.—Survey has been ordered by Freeholders of proposed Absecon-Venice Park Boulevard.

Bridgeton, N. J.—Councilman W. T. Laning has recommended purchase of one carload of Glutrin and also acceptance of offer of the Standard Oil Co. to cover 30,000 sq. yds. of roads with oil binder.

Metuchen, N. J.—Street Committee has been authorized to advertise for bids on 15,000 lin. ft. of sidewalk which advertising will be done as soon as committee in conjunction with Engineer Carman has had time to prepare specifications.

Millville, N. J.—The Millville Municipal League has adopted resolution that State Commissioner of Roads be asked to improve road below Millville without delay.

Morristown, N. J.—Road Committee of Board of Freeholders has decided on extensive road repairs, which will be advertised at once. Bids will be received June 8. Among roads to be improved is Madison Ave., in Morris Township, and three-eighths of a mile in Morristown, which will be repaired with amiesite.

New Brunswick, N. J.—Council has voted to receive bids on Monday, June 15, for resurfacing Carroll Pl. with asphaltic concrete. Improvement will be charged to appropriation for street repaving.

New Brunswick, N. J.—Resolution has been introduced by Freeholder Casey to advertise for bids for construction of second section of Roosevelt Rd. between Roosevelt borough line to Vernon Rd., Woodbridge, after plans have been approved by State Commissioner. Distance to be constructed is .618 miles.

Passaic, N. J.—It has been decided to advertise for bids for macadamizing of several streets as provided for by recent \$20,000 bond issue. These streets are North St., Center St., Charter Oak St., Humboldt St., parts of Woodbridge St., Woodbridge Ave. and Hillcrest Ave.

Binghamton, N. Y.—Following are bids received for paving of Robinson St.: Brick: A. D. Osborne—Bessemer, \$2.14; Mack, \$2.16; Clearfield Clay Working Co., \$2.14; Clearfield Mfg. Co., \$2.14; Binghamton brick, \$1.95 (this was the lowest bid on brick); straight concrete curbing, 55 cents; circular concrete curbing, 60 cents; catchbasins, \$70; cast iron crosswalk plates, \$20; inlets, cast iron, \$20; plastering rails, per lin. ft., one cent. Frank Stento—Bessemer, \$2.28; Clearfield, \$2.10; Binghamton brick, \$2.01; Corning, \$2.20; Potter, \$2.15½; straight concrete curb, 47 cents; circular concrete curb, \$1.25; catchbasins, \$79; cast iron crosswalk plates, \$5; plastering rails per lin. ft., two cents. Tyne & Willey—Bessemer, \$2.10; Binghamton brick, \$1.99½; Potter, \$2.13; Mack, \$2.48; straight concrete curb, 63 cents; circular curb, 75 cents; catchbasins, \$65; cast iron crosswalk plates, \$18; cast iron inlets, \$15; plastering rails, per lin. ft., one cent; Metropolitan, \$2.18; Pennsylvania clay, \$2.12; Marathon, \$2.13; Paxton, \$1.99½. Concrete: A. D. Osborne—One course plain, \$1.40; two course plain, \$1.40; one course reinforced, \$1.50; two course reinforced, \$1.53; one course plain with bituminous top, \$1.44; two course plain with bituminous top, \$1.47; Clearfield, \$2.21; Bessemer, \$2.30; Binghamton brick or concrete, \$2.12. Frank Stento—One course plain, \$1.36; two course plain, \$1.38½; one course reinforced, \$1.41; two course reinforced, \$1.44; one course plain with bituminous top, \$1.47; two course plain with bituminous top, \$1.47; one course reinforced with bituminous top, \$1.58; two course reinforced with bituminous top, \$1.60; vitrified block, \$2.02; Clearfield, \$2.21; Bessemer, \$2.30. Tyne

& Willey—One course plain, \$1.25; two course plain, \$1.35; one course reinforced, \$1.35; two course reinforced, \$1.45; choice of blocks at \$2.23. Bitulithic: Warren Bros. Co., Boston—Bitulithic pavement, \$2.32; choice of Binghamton, Paxton, Porter, Toronto or American fire clay block at \$2.27. Tyne & Willey—Bitulithic pavement on concrete foundation, \$2.34; choice of Foster, Paxton, Pennsylvania clay or Porter block. Warren Bros.—Straight concrete curb, 65 cents; circular concrete curb, 75 cents; catchbasins, \$65; cast iron crosswalk plates, \$15; cast iron inlets, \$12; plastering rails, per lineal foot, 1 cent.

Brooklyn, N. Y.—Sum of \$5,096,300 will be expended this year in paving, regulating and grading and construction of sewers.

Buffalo, N. Y.—Plans for laying about twenty miles of asphalt pavement have been made by engineering bureau, according to Captain George H. Norton, deputy commissioner. Cost is estimated at about \$2.65 a sq. yd. Repairs are expected to call for expenditure of \$209,000 to \$225,000.

Carthage, N. Y.—Board has voted to purchase carload of 85 barrels of "Tarvia B." from Tarvia Company of Edgewater, N. J. This is oil for use on streets for laying dust.

Penn Yan, N. Y.—It has been voted to pave Seneca and Water Sts. with brick.

Saranac Lake, N. Y.—Village trustees have definitely designated Margaret and Circle streets and Park avenue to be improved with sidewalks and macadam paving, and they will advertise for bids for the work.

Columbus, O.—No bids have been received by Highway Commissioner James R. Marker for paving of National Pike with brick of that portion of road in Richland, Union and Kirkwood townships of Belmont county, distance of 16.62 miles, estimated cost of which is \$422,955.74, which, with other two sections of road in same county, made total contract go over \$619,000. Assurances have been given that bid within estimate will be given when letting is again made on June 2.

Dayton, O.—County Commissioners have made automobile tour of county roads for purpose of determining immediate needs of repairs and improvements.

Sandusky, O.—It is probable that first big road construction work in Erie county will be on stretch of 2½ miles at Old Woman creek, in east end of county, a part of proposed Main Market Rd. No. 13, or Lake Shore highway. County Commissioners have approved the plans, affixing their signatures.

Bandon, Ore.—Property owners of 1st St., principal business street of Bandon, have agreed to have street paved with concrete this summer. Proposition will be put up for bids. New water mains and sewers are to be laid at once in order that work on paving may be pushed ahead at early date.

Chester, Pa.—Bids for paving of streets have been opened and left in hands of City Engineer for tabulation. First bids opened were those of Continental Public Works Co., who submitted following bids, with Cambridge Trust Co. as security: For the paving of Welsh St., from Edgmont Ave. to 9th St.; Aztec paving, \$1.97 per sq. yd.; Aztec bituminous concrete cement, \$1.81 per sq. yd.; Roctec, \$1.70 per sq. yd. Madison St., from 23d to 24th St.; Aztec, \$1.93 per sq. yd.; Aztec bituminous concrete cement, \$1.80 per sq. yd.; Roctec, \$1.76 per sq. yd. Highland Terrace, from 15th St. to Rural Ave., Aztec, \$1.83 per sq. yd.; Aztec bituminous concrete cement, \$1.65 per sq. yd.; Roctec, \$1.61 per sq. yd. Parker St., from 9th to 10th St., Aztec, \$1.97 per sq. yd.; Aztec bituminous concrete cement, \$1.81 per sq. yd.; Roctec, \$1.77 per sq. yd. Highland Ave. to a point 900 ft. west, Aztec, \$2.10 per sq. yd.; Aztec bituminous concrete cement, \$1.98 per sq. yd.; Roctec, \$1.94 per sq. yd. Fourth St., from Hinkson St. to Melrose Ave., Aztec, \$2.27 per sq. yd.; Aztec bituminous concrete cement, \$2.12 per sq. yd.; Roctec, \$2.98 per sq. yd. Eighth St., from Edgmont Ave. to Crosby St., Aztec, \$1.99 per sq. yd.; Aztec bituminous concrete cement, \$1.82 per sq. yd.; Roctec, \$1.79 per sq. yd. Twenty-fourth St., Aztec, \$2.19 per sq. yd.; Aztec bituminous concrete cement, \$1.99 per sq. yd.; Roctec, \$1.97 per sq. yd. Esrey St., from 14th to 15th St., Aztec, \$1.97 per sq. yd.; Aztec bituminous concrete cement, \$1.81 per sq. yd.; Roctec, \$1.77 per sq. yd. Ninth St., Barclay to Chester River, Aztec \$1.99 per sq. yd.; Aztec bituminous concrete cement, \$1.64

per sq. yd.; Roctec, \$1.77 per sq. yd. Green St., from Morton Ave. to Caldwell St., Aztec, \$1.74 per sq. yd.; Aztec bituminous concrete cement, \$1.64 per sq. yd.; Roctec, \$1.61 per sq. yd. The next bids opened were those of the Barber Asphalt Co., in which they bid only on Trinidad sheet asphaltum. The bids are for the square yard: Walsh St., from Edgmont Ave. to 9th St., \$2.07; Green St., \$1.92; 8th St., \$2.07; Madison St., \$2.08; Barclay St., \$2.07; 9th St., \$2.07; Esrey St., \$2.08; Highland Terrace, \$1.93; 4th St., \$2.28; 9th St., \$2.24; 24th St., \$2.09. Bids from the Union Paving Co. were opened, with the Delaware County Trust Company and the First National Bank as security. Their bids were for Filbertine and run by the square yard, as follows: Madison St., \$1.89; Barclay St., \$1.97; 8th St., \$1.77; 9th St., \$1.73; Welsh St., \$1.77; Esrey St., \$1.77; 24th St., \$1.73; 9th St., \$1.85; Highland Terrace, \$1.57; Fourth St., \$1.77; Green St., \$1.77.

Johnstown, Pa.—Bids will be received by H. W. Slick, City Treasurer, until 2 p. m., June 12, for purchase of \$100,000 foot front paving bonds of 1914.

Johnstown, Pa.—Ordinances appropriating \$3,200 for repaving with asphalt of Vine street, between Bedford and Franklin streets; \$10,000 for repaving with vitrified brick, on concrete base, of Franklin street, between Sixth and Eighth wards, and \$9,000 for repaving with Belgian block, on concrete base, of Railroad street, between Clinton and Adams streets, have been introduced at meeting of council.

Johnstown, Pa.—Ordinance for paving of part of Vine St. with asphalt has been passed finally, also ordinance for the \$10,000 paving job on Franklin St., between 6th and 8th wards, vitrified brick with concrete base.

Lewistown, Pa.—Voters have indorsed the \$28,000 loan for opening of South Dorcas and Spruce streets and paving of South Main street and Pannebaker avenue.

New Castle, Pa.—Proposed state highway between Monaca and Aliquippa is now practically assured, and plans have been made for building of road. State will bear one-half of cost of highway, county one-fourth, and Mon township, through which the road will pass, will bear other fourth of cost. Highway itself will cost approximately \$86,000, but there will be several fills necessitated, and those alone will cost nearly \$140,000.

Plains, Pa.—Township Commissioners have decided to hold over bids for proposed street improvements in order to give Engineer Paxton additional time to prepare plans. Secretary Rowlands was instructed to advertise ordinance once a week in one daily paper. Bids must be submitted to secretary not later than 7.30 p. m. on June 15.

Pottsville, Pa.—Bids will shortly be advertised for paving of Logan St., from East Norwegian St. to East Arch St., with good quality of paving brick or block or such other suitable paving material as the Council may select after bids have been opened, upon concrete base, same to be set with concrete curb entire distance of proposed pavement.

Reading, Pa.—Reading will start work on street paving and road improvements that are to cost \$235,000.

Waynesboro, Pa.—Council has passed ordinance to pave West Main St., between Fairview Ave. and the borough limits, with Mack hillside brick.

Wilkes-Barre, Pa.—Wilkes-Barre Township Commissioners have received proposals for curbing and paving Nicholson, Blackman and Charles Sts. Following are bids for curbing and paving: Herriek Construction Co., Mack brick, \$2.40 per sq. yd.; Toronto, \$2.32; Bolivar, \$2.35; Pennsylvania clay, \$2.35; Bessemer, \$2.29; Alton, \$2.29; American, \$2.37; C. C. W., \$2.35; White Haven red stone curbing, 24 in., 90 cts. lin. ft., 30 in., \$1.15; circular, 24 in., \$1.60; concrete cross headers, 15 in., 35 cts.; inlets, \$20 each; catch basins complete, \$45; excavating, over 12 in., 60 cts. per cu. yd.; rock excavating, \$2.25; pave with Amiesite, \$1.73 per sq. yd.; Westermite, \$1.78; Davis & Parry's bid, Mack brick, \$2.41; C. C. W., \$2.40; Toronto, \$2.36; American, \$2.40; Porter, \$2.40; curbing, 24 in., 95 cts. per ft.; 30 in., \$1.20; circular curb, 24 in., \$2; concrete cross headers, 15 in., 55 cts.; concrete wall and steps complete, \$7; inlets, \$25 each; catch basins, \$35 each; excess excavating, 50 cts. per cu. yd.; rock, \$1.50 per yd. M. J. Malloy, C. C. W., \$2.34; Toronto, \$2.32; American, \$2.28; Mack, \$2.40; Porter, \$2.39; Pennsylvania clay, \$2.35; curb-

ing, 24 in., 88 cts.; 30 in., \$1.12; circular, 24 in., \$1.62; concrete headers, 36 cts.; concrete wall and steps complete, \$7 per cu. yds.; inlets, \$22 each; catch basins, \$34 each; excavating, 55 cts. per yd.; rock excavating, \$1.45.

Pawtucket, R. I.—Ordinances providing for four separate issues of bonds, proceeds to be expended for construction of highways, erection of bridges and water works construction, have been passed by Common Council and concurred in by Board of Aldermen. Ordinances provide for total issue of \$325,000, of which \$150,000 is to be expended on highways and bridges, and \$175,000 for water works construction.

Woonsocket, R. I.—Mayor Daignault has approved of resolution appropriating \$55,000 for paving of North Main St.

Bristol, Tenn.—Sullivan county will this week sell \$100,000 road bonds, to continue work of building macadamized highways. Road Commission has received bids from many bond buyers and will shortly sell bonds and award contract for remainder of the work. Contractors Oliver & Hill, of Maryville, who have last contract of \$200,000, will bid on remainder of work.

Bonham, Tex.—Bond issue in sum of \$250,000 for good roads has been voted.

Dallas, Tex.—Street Commissioner S. B. Scott has said he estimated street improvement work for current fiscal year would total approximately \$625,000. About \$120,000 would be available from this year's revenues, he estimated, while \$305,000 was under contract at beginning of fiscal year. Probably \$200,000 more would be under contract and started at close of year.

San Antonio, Tex.—At next meeting of City Council paving contractors will be asked to submit bids on approximately 200,000 sq. yds. of paving. Resolution calling for bids will be passed and it is expected bids will be opened two weeks later.

San Antonio, Tex.—Bids aggregating probably another 100,000 sq. yds. of paving will be called for by City Council shortly. The paving program will be spread again into every section of city, and for most part will be work on residence streets.

Ogden, Utah.—City Engineer Washington Jenkins has planned laying out of boulevard on both sides of Ogden River, from western limits of city to mouth of Ogden Canyon.

Ogden, Utah.—City Board of Commissioners has directed city recorder to publish notices that bids will be received for paving with asphalt of Hudson Ave., between 23rd and 24th Sts.; the concrete paving of 27th St., between Washington and Jefferson Aves.; sidewalk paving on Hudson, between 23rd and 24th, on Harrison Ave., between 25th and 26th Sts., and on 30th St., between Wall and King Ave.

Winooski, Vt.—Cement walks costing in aggregate about \$3,000 will be laid in several streets of village this summer.

Olympia, Wash.—State highway department has opened bids for 8.7 miles of Inland Empire highway, from Rosalia to Cashup, in Whitman county. Eight bids were entered, three of which were so close together that board has held up award pending further study of bids and methods of construction. Three bids were as follows: Northwest Paving Co. of Spokane, \$30,001; Leonard A. Andrus and C. H. Maginnis of Portland, \$30,362, and Carlson, Chindal & Co. of Spokane, \$30,429. Highest of eight bids was \$33,723.

Tacoma, Wash.—As outcome of arrangements made between City Council and Board of County Commissioners for grading Pacific avenue for distance of about two miles from South 64th street to city limits on south, city engineer's office is preparing specifications for work, with view to calling for bids at once. Initial resolution has already been adopted by council, and date of remonstrance set for May 25. Work will cost about \$27,500.

Superior, Wis.—Five miles of new cement sidewalk have been ordered constructed by City Commission.

Superior, Wis.—Four contracts for improvements to highways of Douglas county will be awarded shortly to the lowest bidders for work. Roads which will be paved and graded are as follows: South Tower Ave., city limits to Greenwood Rd., to be paved with concrete; Nebagamon to Hawthorne, four miles, graded; Grand Ave., from Cutter Rd. to Spaulding Ave., three miles, macadamized; Tototetie Rd. near Wascott, half-mile macadamized. More than 20

jobs are to be carried to completion this year, including several which will connect highways already macadamized and graded. Outline of year's work is as follows: Black River Falls, east and west road—Grade one mile, gravel one mile east of Foxboro, bridge Big Balsam and fill near Black River Falls; estimated cost, \$8,600. Bardonia Ave.—Grade one mile on range, grade from present rock road three miles southward, grade one mile north of rock toward city, rock or other permanent surface two miles of Tower Ave. to Greenwood (probably at least 12 ft. wide at cost of \$16,000); total estimated cost, \$23,400. Rossiter Ave.—Grade a mile and a half south from Rossiter to Spaulding Ave., three miles (at a cost of \$14,000) and grade from Spaulding Ave. to Bayfield Rd., a mile and a half; estimated cost of both, \$16,500. Central State Rd.—Solon Springs to Gordon, grade, fill and cut one mile, gravel Moose Rd. to Gordon, two miles, Gordon to Wascott, new road, five miles, Wascott west to schoolhouse, new road, one mile; estimated cost, \$12,200. Lakeside Rd.—Grade four miles east of Amnicon river and build bridges over Middle and Poplar rivers; total estimated cost, \$12,000; Spaulding Ave.—Grade from 1½ miles east of Grand Ave. to one mile west of Wentworth, 2½ miles, build road three miles from Poplar to Maple; estimated cost, \$9,000. Nebagamon Rd.—Grade from Grand Ave. to Nebagamon, four miles, grade from Nebagamon east to Winneboujou, 2½ miles; estimated cost, \$10,500. Highland Rd.—Grade from Winneboujou south, 1½ miles; estimated cost, \$2,000. Brule Rd.—Grade one mile south from Brule and build bridge; estimated cost, \$3,000. Total estimated cost, \$103,600. In this summary is not included several miles from Brule to the easterly county line which some advocate building as a link in the line to Ashland and Bayfield. If this is done the cost is estimated at \$15,000 (no rock being included).

Washburn, Wis.—Plans for expenditure of about \$30,000 in permanent improvements on bridges and roads of Bayfield county have been prepared by county officials.

Niagara Falls, Ont., Can.—Stamford Council has decided to macadamize Stanley St. from Murray St. to Portage Rd., Portage Rd. from Stanley St. to Loretto Academy, a portion of Dunn St. at Falls View, and extend Portage Rd. from the strip of concrete pavement to Queens-ton Heights.

CONTRACTS AWARDED.

Santa Ana, Cal.—By Board of Supervisors contract for paving of East Chapman Ave. between McPherson and El Modena. The O. & C. Construction Co. got contract on bid of \$6,799, the Mercereau Bridge & Construction Co. bidding \$6,868. This contract is for mile of road on road that is to be paved to Orange County Park.

Lisbon, Conn.—By State Highway Com., Hartford, for construction of section of native stone macadam road in Lisbon on Newent Road, to Fred H. Gilbert, Jewett City, at \$17,000.

Torrington, Conn.—Contractor Caesar A. Ross of Torrington has been notified that he was successful bidder for big state road job to be done in that part of Empire state in Warren county, near Vermont line.

Chicago, Ill.—By Board of Local Improvements for construction of 16 ft. cement sidewalks on various streets to General Cement Construction Co. and Standard Concrete Const. Co.; 6-ft. cement sidewalks to G. Kehl & Son Co.; Albert Graff; P. F. Biesen; Siewert-Callen Co.; Daniel Ryan; A. C. Skafgard and H. P. Larsen. Edward J. Glackin is Secretary.

Kankakee, Ill.—For concrete paving Washington Ave. south by Bd. Pub. Improvements to C. W. Jensen & Co., Chicago, \$15,644.

New Castle, Ind.—For improvement of South Main street there were four bids. Howard Payne's bid for Metropolitan block was \$1.89 a square yard; for Brazil brick, \$11,897.65. Bid of Charles W. Improvement of street with Metropolitan block was \$12,559.45, and with Brazil block, \$11,897.65. Bid of Charles W. Minnick was not signed, and therefore was not considered. James Garvey of New Castle, Ind., bid \$1.58 for Brazil block and \$1.68 for Metropolitan brick. His total bid for the improvement of the street, using Brazil brick, was \$8,460, and for Metropolitan block, \$8,951.50. The Union Asphalt & Cement Co. totaled \$13,742.40. Preliminary award of contract was given to James

Garvey for Brazil brick. Contract will be ratified if no objections are made to bids. There were three bidders for improvement of Walnut street. Payne, Garvey and the Union Asphalt Co. all submitted bids, but Garvey was again low man, and preliminary award was given him. Howard Payne was awarded contract for improvement of Bundy avenue. He bid \$97.50 against Garvey's bid of \$109.20. Work includes cement curb, gutter and sidewalks on west side of avenue from Main to Mowrer streets. Garvey was only bidder on improvement of North 16th street, and contract was awarded him. He bid \$830 for the job.

Richmond, Ind.—For paving North 7th St. with Peebles wire-cut brick to Cronin & Meredith at \$1.87 pr. sq. yd.

Elkader, Ia.—For grading 1,800 ft. and surfacing 5,300 ft. road west of Strawberry Point, to Paul N. Kingsley, Strawberry Point, as follows: Earth excav., 35 cts. per cu. yd.; earth fill, 30 cts. per cu. yd.; rock excav., \$1 per cu. yd.; 3½-in. macadam surface, 1 course, 35 cts. per sq. yd.; 7½-in. macadam surface, 2 courses, 50 cts. Edw. B. Tourtellot is County Engr.

Baltimore, Md.—Two big contracts for work have been let by State Roads Commission, as follows: Hanover St., from Baltimore St. to Lee, American Paving and Contracting Co. of Baltimore, sheet asphalt, \$27,637. This will give a continuous smooth street from Baltimore St. to the water front at Spring Gardens, and make a connection with the new bridge. Belair Rd., from North Ave. to the city limits, 89-100 mile, sheet asphalt; P. Flanagan & Sons of Baltimore, \$67,402. Other contracts awarded today included work in counties, as follows: Norbeck to Olney, 3.67 miles; Charles T. Eastburn Co., \$25,263. King's Valley-Clagettville, 3.54 miles; W. H. H. Allen Construction Co., \$42,661. Allegany county, McKenzie Station to C. & W. Ry., 3.56 miles, Vang Construction Co., \$37,814. District of Columbia line to Camp Springs, 4.77 miles; Charles T. Eastburn Co., \$36,815. Chestertown to near Fairlee, 3.92 miles; Betts & Boice, \$42,284. Queen Anne's county, Roberts Station to Caroline county line, 5.25 miles; Burgess Bros. & Burgess, \$62,145. Town of Galena, 0.74 miles; M. J. Best, \$8,668. Green Ridge to Washington county line, 7.84 miles; Burgess Bros. & Burgess, \$53,120.

Attleboro, Mass.—Contract has been let to Independent Coal Tar Co., of Boston, for about 2,200 yds. of road work.

Grand Rapids, Mich.—Following are low bidders for street improvements: Lockwood street improvement, Kloote & Son, \$2,595.25; Norwood avenue improvement, Peter Vanderveen, \$3,993.25.

Benidji, Minn.—Following favorable action by State Highway Commission, contracts have been let for building of Elwell road between Benidji and International Falls. Patridge & Harmon will get contract for entire highway, with exception of section B, which is largely ditch work. George A. Snyder of International Falls will get this contract.

Floodwood, Minn.—Victor Carlson has sub-contracted 7 miles of Duluth-St. Vincent road from E. A. Dahl & Co., successful bidders on entire job.

St. Paul, Minn.—By Board of Public Works for grading and curbing Como Ave., from West Central Ave. to Eustis St., to W. H. Maline, 1541 Ashland Ave., at \$6,670.

Freehold, N. J.—For constructing 3 miles of Jerseyville-Hamilton Gravel Road by Board Chosen Freeholders to Jos. L. Butcher, Farmingdale, at \$10,984.

Morristown, N. J.—Bids have been received for the construction of new roads along Alexander Ave., from Main St. to Grove St.; Brittin St., from Greenwood Ave. to Alexander Ave., and Grove St., for same distance. Contract was awarded J. B. Gougherty, whose bid was 44 cts. per yd., against 66 cts. per yd. by F. S. Smith, the only other bidder. Bids on both macadam and iron slag construction were asked, but committee decided in favor of former method of construction.

New Brunswick, N. J.—At meeting of Board of Freeholders Thomas H. Riddle of New Brunswick was awarded contract for construction of first section of Woodbridge-Roosevelt road, his bid being \$26,990.

Cortland, N. Y.—For paving Main St., to Tyne & Willey, Binghamton, at \$29,-441. J. R. French is City Clk.

Islip, N. Y.—For constructing concrete sidewalks in Bayport, Sayville, West Sayville, West Islip, Brentwood and Central Islip to Gifford Constr. Co., Jamaica, at \$17,000.

Rochester, N. Y.—By Board of Contract and Supply to Julius Friedrich, of Rochester, for paving Bonivard St. with asphalt at \$1.66 per sq. yd.

Mount Airy, N. C.—By Highway Commission of Mount Airy Township contract for construction of 25 miles of road to well known firm of Smith & Sweeney of Atlanta, Ga., and this road is to be completed ready for sand-clay during coming summer.

Dayton, O.—Commissioners have let contract for oiling three miles of Shakerstown pike to M. C. Whitmore, representing the Indiana Refining Co.

Catasauqua, Pa.—Contract for paving of Bridge St., Catasauqua, with asphalt and local stone has been awarded to George H. Hardner, of Allentown, at \$1.55 a sq. yd.

Erie, Pa.—Two big paving contracts have been awarded by Council. Mayer Bros. Constructing Co. being successful bidder for grading, curbing and paving East Seventh St., from Wallace to East Ave., and J. & M. Doyle for grading, curbing and paving Wayne St., from 18th to 21st St. Both streets will be paved with asphalt. Bid of Mayer Bros. for work on East 18th St. was \$16,705. J. & M. Doyle's bid for work on Wayne St. was \$6,129, city engineer's estimate being \$7,000.

Lehigh, Pa.—To Horn & Neff, of Weissport and Slatington, contract to pave 1st St., Lehigh, at \$2.16 a sq. yd.

Reading, Pa.—Yocum Bros. were awarded contract for paving of vitrified brick alleys advertised by Bureau of Health at their price bid of \$1.99 a square yard. The Mack Brick Co. of Philadelphia awarded contract to furnish yellow vitrified block at \$25.65 a thousand. Gutter block award was made to Glen-Gery Co. for \$15.65 a thousand. D. C. Geiger was awarded contract to furnish Portland cement at \$1.66 a bag, with 10 cents returned for bags. Standard Oil Co. was awarded contract to furnish road binder at .0835 a gallon.

York, Pa.—Awards for street paving were made as follows: West Philadelphia street, from Newberry to the creek, General Supply & Construction Co. of York, Mack block, \$2.43 a square yard. Mr. Lindsey voted in opposition to this award. West College avenue, between George and Water streets, Mack block, \$2.26 per square yard; East King street, between Duke and Pine streets; East Mason alley, from Court alley to Duke street; West Princess street, from George to Water; East Princess street, between George and Queen streets; Mack block, at \$2.31 a square yard. North Belvidere avenue, between Linden and Madison avenues; North Hawthorne street, between Linden and Madison avenues; North West street, between Linden and Madison avenues; Royal street, between Market and King streets; West King street, between George and Water streets; South Queen street, between Market street and Cottage place; South Pine street, between Market and King streets; East Market street, between Lehman and Harrison streets; East Cottage place, between George and Queen streets; Standard Bitulithic Co., bitulithic material, \$2.25 a square yard.

Williamsburg, Pa.—For paving about one mile of streets to Standard Co. of this city at \$2.15 for brick, which is material for portion of work. Concrete will be used for remainder.

Providence, R. I.—Board of Contract and Supply has opened bids for paving Franklin St. extension with wood blocks and for construction of sewers on Daniel, Ticonderoga and New York Aves. Contract for wooden block pavements was awarded to Franklin Construction Co. of New York for \$9,081.31. Other bidders were the Narragansett Improvement Co., the United States Wood Preserving Co. and Famiglietti Brothers.

Houston, Tex.—Ordinance has been adopted prescribing vertical fibre brick with asphalt filler as paving material for Robin, from Smith to Heiner, and awarding contract for paving to Eureka Paving Co., of Houston, and appropriating \$5,000 to cover cost of paving. Also to same company, contract for paving Wilson and Andrews streets, at \$2,400 and \$5,700 respectively.

Price, Utah.—O. S. Harris of Price has been awarded contract of making concrete sidewalks of Price by City Council for 11 cts. a sq. ft. Contract calls for expenditure of about \$40,000. Harris

will pave sidewalks of city for about 5 miles.

Auburn, Wash.—For graveling H. H. Howard Rd., by King County Comr. to Washington Paving Co., Savage-Scofield Bldg., Tacoma, at \$36,538.

Everett, Wash.—For improvement of Hoyt avenue, to Grays Harbor Construction Co. of Aberdeen, at \$60,497.34. Street is to be regraded, paved with asphalt and sidewalked with cement.

Fond du Lac, Wis.—City has let contract for 10,000 gals. of oil for use on streets to Standard Oil Co.

SEWERAGE

South Pasadena, Cal.—City has been authorized to issue bonds in sum of \$200,000 for construction of complete sewer system. B. V. Garwood is City Clerk.

Bridgeport, Conn.—Board has voted to advertise for bids, to be opened June 9, for building of the Knowlton St., or the East Side intercepting sewer, ordered by the Superior Court, the Capital Ave. sewer and sewer in Park Ave., north of North Ave. City Engineer Terry stated that he was all ready with plans of those three sewers. The bond issues for sewers is \$300,000. Probabilities are that the sewer work in this city this summer will be more extensive than at any time in the history of city.

Dade City, Fla.—On June 23 taxpayers will vote on \$6,500 bond issue for sewers, mains and septic tanks.

Lafayette, Ind.—Construction of sewer for benefit of people living in Sixth ward, to follow course of Durgess run, is being discussed.

Mishawaka, Ind.—Council has decided to construct trunk sewer on Charlotte St.

Creston, Ia.—Resolution is being considered for construction of about 700 ft. of 8-in. and 1,600 ft. of 6-in. sewers. J. W. Wadsworth is Mayor and Theo. S. De Lay is Civil Engr.

Salina, Kan.—Ordinance has been passed providing for issuance of sewer improvement bonds of City of Salina in sum of \$19,100. C. E. Banker is City Clerk.

Goshen, N. Y.—Bids were opened May 15 by Village Trus. for system of sewers and sewage disposal plant from plans of Clyde Potts, Engr., 30 Church St., New York: (1) Fred. E. Gross & Son, Inc., Yonkers, \$92,939; (2) John W. Heller, Newark, N. J., \$94,391; (3) Abner M. Harper, Inc., Newburg, \$98,642; (4) Jos. L. Sigretto & Co., Woodhaven, L. I., \$98,817; Berardino & Tomassetti Co., Meriden, Conn., \$101,861; Peekskill Constr. Co., Peekskill, \$107,504; Riverdale Contr. Co., New York, \$110,934; John J. Hart, Peekskill, \$112,402; Martin & Miller, Caldwell, \$116,065; Transit Constr. Co., Mt. Vernon, \$121,586; Frank Puglia, Paterson, N. J., \$122,650; Edw. B. Roberts, Pittsfield, Mass., \$125,478; New York Sewage Disposal Co., New York, \$127,284; Smith Bros., Pelham, \$138,964; Watson Eng. Co., New York, \$150,919.

	(1)	(2)	(3)	(4)
Terra Cotta Pipes:				
25,322 ft. 8-in., 0-6 deep.....	\$0.63½	\$0.47	\$0.50	\$0.65
19,722 ft. 8-in., 6-9 deep.....	.76½	.60	.65	.65
2,995 ft. 8-in., 8-10 deep.....	1.03½	.75	.82	.65
55 ft. 8-in., 10-12 deep.....	1.43½	1.20	1.16	.65
.. ft. 10-in., 0-6 deep.....	..	.80	.70	.65
.. ft. 10-in., 6-8 deep.....	..	.90	.85	.65
7,492 ft. 12-in., 0-6 deep.....	.81	2.69	.71	.90
280 ft. 12-in., 6-8 deep.....	.95	.80	.86	.90
125 ft. 12-in., 8-10 deep.....	1.21	.95	1.02	.90
65 ft. 12 in., 10-12 deep.....	1.74	1.35	1.30	.90
130 ft. 15-in., 0-6 deep.....	.94	1.85	.92	1.40
365 ft. 15-in., 6-8 deep.....	1.08	1.05	1.12	1.40
120 ft. 15-in., 8-10 deep.....	1.34	1.20	1.30	1.40
625 ft. 15-in., 10-12 deep.....	1.87	1.55	1.61	1.40
.. ft. 15-in., 12-14 deep.....	..	2.75	2.28	1.50
2,439 ft. 18-in., 0-6 deep.....	1.28	1.20	1.26	1.40
1,579 ft. 18-in., 6-8 deep.....	1.35	1.42	1.40	1.54
1,035 ft. 18-in., 8-10 deep.....	1.55	2.40	1.78	1.69
710 ft. 18-in., 10-12 deep.....	1.75	3.25	1.99	1.84
110 ft. 18-in., 12-14 deep.....	2.25	4.20	2.49	1.99
.. ft. 18-in., 14-16 deep.....	..	6.25	2.99	2.14
.. ft. 18-in., 16-18 deep.....	..	8.50	3.69	2.50
300 ft. 5-in. deep house connection.....	1.00	.25	.16	.50
5 M ft. foundation timber.....	60.00	40.00	50.00	30.00
2 M ft. sheathing timber.....	40.00	35.00	50.00	30.00
28 tons c-i. pipe.....	40.00	50.00	30.00	25.00
50 yds. concrete, Class "A".....	6.00	7.50	5.00	8.00
10 yds. concrete, Class "B".....	7.00	6.50	7.00	8.00
1,500 lbs. reinforcing steel.....	.08	.03½	.03	.03
Fill.....	1.00	1.00	.90	.50
225 manholes, 0-6.....	36.00	35.00	37.00	34.00
100 ft. manholes, extra depth.....	4.00	3.00	6.50	4.00
5 lamp holes.....	15.00	15.00	8.00	5.00
3,250 yds. rock excavation.....	2.75	2.50	3.00	1.50
Disposal works.....	22,000.00	31,974.00	34,000.00	35,000.00

Pittsfield, Mass.—Figures relative to cost of sewage disposal plant will be presented to City Council at early date by Chairman Jay P. Barnes of Board of Public Works.

Monroe, Mich.—City attorney has reported that it would cost \$102,000 to build trunk sewers on north and south sides of city. Cost of south side sewer would be \$76,000. City Commission and citizens will discuss advisability of putting question to vote.

St. Joseph, Mich.—Sewer committee of the board of public works, composed of John A. Freitag and A. T. Vail, in report to City Council filed recently, recommends that open sewer running through ravine back of Langley Ave. be converted into 6-ft. underground trunk line. Cost is estimated at \$3,500 and committee asks that \$2,500 be included in annual appropriation ordinance. Remainder of cost, \$1,100, will be covered by annual sewer tax.

St. Paul, Minn.—Two sewerage projects have been before Assembly for final orders. The big Snelling-Como sewerage system, estimated to cost \$309,000, and with only \$132,000 provided, was passed. The Front St. project, involving \$54,000 and with about \$35,000 available, was defeated.

Milwaukee, N. J.—Ordinances have been passed on first and second readings for construction of sewer and water systems and issuance of bonds therefor. Bond issue for water works will be \$45,000 and for sewer system \$57,500.

South Amboy, N. J.—Bids of Outwater & Wells for \$15,000 worth of sewer bonds has been accepted.

Brooklyn, N. Y.—See "Streets and Roads."

Cortland, N. Y.—Extensions to sewer mains have been ordered in West Main, Floral avenue, East avenue, Perne avenue, Harmon avenue and Evergreen street—a total of 4,795 feet, at estimated cost to the city of \$5,370.

Oswego, N. Y.—Commissioner of Works C. W. Linsley and City Engineer James Flanagan have given out list of sanitary sewers which will be constructed with funds to be derived from sale of Oswego city bonds authorized by council, and sold to Estabrook & Co. Plans for these sewers have all been prepared, and contracts will probably be awarded within 20 days.

Oswego, N. Y.—Department of Public Works proposes to construct sanitary sewers in about 30 streets. C. W. Linsley is Comr. of Works.

Hazleton, Pa.—Loan of \$300,000 is being discussed. Bulk of money will be designated for sewers in annexed section. There will be some for street improvements. Question will possibly be submitted to voters at next election.

Philadelphia, Pa.—About 150 citizens have called on Jenkintown borough council and urged immediate action on sewage problem and two committees have been appointed to take up the matter.

Wilkes-Barre, Pa.—Following contractors bid on storm sewer work: Herrick Construction Co., Davis & Parry, R. M. Rosser and Banks Construction

Co. It is estimated that sewer work will cost in neighborhood of about \$15,000 when complete.

Woonsocket, R. I.—Resolution appropriating \$18,349 for sewer construction work has been approved.

Allendale, S. C.—See "Water Supply."

Vermillion, S. D.—Preliminary steps in connection with construction of proposed drainage ditch, which is estimated to cost about \$160,000, will be taken at joint meeting of members of Board of County Commissioners of Clay and Yankton counties, to be held May 26.

Houston, Tex.—Mayor Campbell in annual message recommends erection of suitable sewage disposal plant.

Italy, Tex.—Engineers are at work plotting town, preparatory to making preliminary survey for sewer system, which it is intended shall be financed by issuance of bonds. As soon as necessary surveys have been made, election will be called by City Council for purpose of voting on proposition, which it is believed will carry almost unanimously.

Alexandria, Va.—Total of \$4,700 has been appropriated for construction of sewers in northwestern section of city in vicinity of Alfred, Pendleton, Wythe and Columbus Sts.

Casper, Wyo.—Electors have voted \$15,000 in bonds for extension of sewer system.

CONTRACTS AWARDED.

Santa Ana, Cal.—To C. McNeill, contract for installing sewer system for County Farm. His bid was \$5,545. Geo. Kuechel, of Orange, bid \$5,896.75.

Sunnyvale, Cal.—For constructing sewer system, to Wm. Heafey, Oakland, at \$32,236. Ida Trubschenck is Town Clerk.

Atlanta, Ga.—Contract for constructing two groups of lateral sewers has been awarded to F. D. Harvey & Co., of Memphis, for \$13,910.

Joliet, Ill.—By Board of Local Improvements, for construction of sewers in streets of Third and Fourth wards, to Robert Shannon, at following prices, to-wit: 960 feet, price per lineal foot for all material and construction of double strength 36-inch pipe sewer with Ts, Ys, etc., \$3.90; 680 feet double strength 33-inch pipe sewer with Ts, Ys, etc., \$2.90; 1,055 feet double strength 30-inch pipe sewer with Ts, Ys, etc., \$2.40; 3,378 feet 15-inch pipe sewer with Ts, Ys, etc., 47 cents; 3,961 feet of 12-inch pipe sewer with Ts, Ys, etc., 37 cents; 5,511 feet of 10-inch pipe sewer with Ts, Ys, etc., 29 cents; 2,295 feet of 8-inch pipe sewer with Ts, Ys, traps, etc., 19 cents; 8,221 feet of 6-inch pipe sewer with Ts, Ys, stoppers, markers, etc., 11 cents; 5,275 feet, price per lineal foot for excavation and backfilling under 6 feet in depth, 19 cents; 15,085 feet, over 6 feet and under 8 feet in depth, 33 cents; 5,359 feet, over 8 feet and under 10 feet in depth, 51 cents; 2,610 feet, over 10 feet and under 12 feet in depth, 90 cents; 375 feet, over 12 feet and under 14 feet in depth, \$1.10; 347 feet, over 14 feet and under 16 feet in depth, \$1.50; 650 feet, price per lineal foot for all material and construction of 27-inch double strength sewer pipe with Ys, etc., \$2.30; 28,266 feet rock trench, per lineal foot, per foot in depth, 26 cents; 21 feet, price per square yard for repaving brick gutters, \$1; 5 manholes rebuilt, each \$10; 64 manholes complete, each \$30; 129 catch-basins complete, each \$31; 1,113 square yards macadam pavement, relaid, per yard, 50 cents; 1,070 feet, price per lineal foot construction of 24-inch sewer pipe with Ys, etc., \$1.30; 1,010 feet, price per lineal foot for 20-inch tile complete, 90 cents; 350 feet, price per lineal foot for 18-inch tile complete, 70 cents.

Upper Alton, Ill.—To Chas. E. Van Wormer, Springfield, for construction of sewers, at about \$50,000.

Huntington, Ind.—To Thomas J. McGovern, contract for building of Wright St. sewer, by Board of Public Works. McGovern's bid was \$3,184 a lineal foot.

Alexandria, La.—By Council to Gray & Short, Ruston, at \$10,971 for extension of sewer system. Contract for sewer pipe was awarded to Texarkana Pipe Co., Texarkana, at \$9,093.

Grand Rapids, Mich.—Following are low bidders for sewer construction: Dean street sewer, Zoumer & Vander Zwart, \$3,100.02; Griggs street sewer, Zoumer & Vander Zwart, \$496.

St. Paul, Minn.—P. J. Ryan has been awarded sewer job on Front St., from Dale to Mackubin at \$1,840. Same contractor will build sewer on Reaney St., near Clarence, his bid being \$397. He also obtained sewer work at Curtice St. between Oakdale and Woodbury St., at

cost of \$2,243. C. A. Carlson & Son got sewer work on Fauquier St., from English to Atlantic, at \$1,279. Doherty & Son got sewer contract on Winona St., from Ohio to Marion, at \$1,204.

Newark, N. J.—By Passaic Valley Sewerage Commissioners for foundations and connections of Newark Bay pumping station, part of Sect. 5, to P. J. Moranti, Inc., New York, at \$355,400.

Roselle Park, N. J.—For construction of concrete storm sewer in Grant Ave., from Galloping Hill road to Hemlock Ave., to T. Foster Callahan, of Elizabeth, lowest bidder, at cost of \$3,634.50.

South Amboy, N. J.—For construction of 400 ft. of 8-in. sanitary sewer in Henry St., to Thomas Downs at 57 cts. per lin. ft. and \$24 each for manholes.

Rochester, N. Y.—For installing sewer system in Howe Acres tract at Monroe and Highland Aves., to Nicholas Desiderio, at \$32,128.

Schenectady, N. Y.—Bids have been opened for construction of storm water sewers on Avenue B, Beaver St., Gerling St., Raymond St. and Seneca St. Charles Ippolito, \$6,875.90; Kellam & Shaffer Co., \$7,025.70; Thomas F. MacGregor, \$5,179.30; W. D. Goodale, \$6,085.50; Kalteaux & De Nallo, \$6,819.58; John Allen, \$5,866.60; Bethwith Bros., \$6,287.40; Kehoe & Bisset, \$7,288.50; Thomas Crane, \$6,666.40. Also for sanitary sewers on Hampton Ave., Wright Ave., Milton Ave., Oakland Ave., William St. and Regal Ave. The figures are: Thomas F. MacGregor, \$5,337.56; Kellam & Shaffer, \$5,246.27; W. D. Goodale, \$6,391.78; Charles Ippolito, \$11,048.04; Kehoe & Bisset, \$7,942; Thos. R. Crane, \$7,467.26; Kalteaux & De Nallo, \$6,226.51; John Allen, \$7,082.39; Beckwith Bros., \$7,770.74. Resolution was adopted awarding contract in both cases to Thomas F. MacGregor as being lowest bidder.

York, Pa.—Construction of additional sanitary sewer laterals which it is proposed to put down this summer goes to Bruno Pizzimento, Seneca Falls, N. Y., at his bid of \$4,008.43. Storm water sewer extensions on West College avenue, East King street and East Mason alley will be made by G. W. Ensign, Inc., Harrisburg, at an aggregate bid of \$2,385.53. For this same work the General Supply & Construction Co., York, bid \$2,667.14, and H. C. Brooks & Co., Martinsburg, W. Va., \$2,901.46. The General Supply & Construction Co. will build the storm water sewer extensions on South Cherry street, East Church alley, East Cottage place, Glen alley and West King street. This company bid an aggregate of \$19,423.67 for the work. The Ensign bid for same sewers was \$19,278.49, and the Brooks bid, \$19,839.64.

Providence, R. I.—To Valley Contracting Co., contract for building Daniel and Ticonderago Ave. sewers and to Antonio Aiello contract for New York Ave. sewer.

London, Ont.—For storm sewers by City Council, as follows: T. W. Nicholson, Williamson Bldg., Cleveland, O., Egerton St., sewer, \$148,160; F. T. Harding, King St., London, Adelaide St. sewer, \$27,209; McLaughlin Bros., 574 Somerset St., Ottawa, Colborne St. sewer, \$40,479; J. H. McKnight Constr. Co., Toronto, Ridout St. sewer, \$32,654; McKay & Webster, Hamilton, Wharnccliffe Rd. sewer, \$23,415. Wm. N. Ashplant is City Engineer.

Vancouver, B. C.—For constructing 48th St. sewer by City Council to R. McLean & Co., 744 Hastings St. W., at \$10,000.

WATER SUPPLY

Nevada City, Cal.—City Trustees have worked out and adopted water system for Nevada City. Board has decided to establish reservoir in old McCutcheon Diggings, a mile from this city. Work on reservoir will commence at once. City will use its water right on Little Deer Creek. Reservoir will be 20 ft. deep and will have capacity of 15,000,000 gallons.

Dade City, Fla.—Taxpayers will vote June 23 upon question of bonding city for \$26,500, of which \$20,000 is for municipal water works system and \$6,500 for sewers, mains and septic tanks.

Kalamazoo, Mich.—Plans for extension of water mains are now being gone over by Water Department of city government and question will probably be submitted to Council at meeting in two weeks.

Grand Island, Neb.—Purchase of two 750-gal. No. 12 pumps from American Well Works has been recommended at \$1,394 each.

Asbury Park, N. J.—City will vote on June 9 on bond issue of \$50,000 for improvements to water system. S. H. Calvert is City Clerk.

Milltown, N. J.—See "Sewerage."

Perth Amboy, N. J.—Ordinance providing for issue of water bonds of city of Perth Amboy, amounting to \$100,000 has been passed by Board of Water Commissioners. Proceeds from sale of bonds are to be used to pay for cost of constructing a 30-in. main from Runyon water works to standpipe at Ernston, for purchase and installation of new artesian well pump at Runyon, etc. Furnishing and laying complete of 13,000 ft. of 30-in. main from Runyon water works to Runyon is estimated to cost in neighborhood of \$65,000. If there is money remaining from sale of bonds after paying for main and artesian well pump, it will be applied to cost of erection of standpipe, which is about to be placed in northwestern section of city.

Perth Amboy, N. J.—Bids have been received and opened for furnishing of 13,000 ft. of 30-in. bell and spigot cast-iron pipe with valves and specials, as estimate A; for furnishing and laying complete 13,000 ft. of 30-in. main with valves and specials, as estimate B, and for carting and laying 13,000 ft. of 30-in. main as estimate C. Action in awarding contracts was deferred by committee of whole after considering proposals. Among bidders were following: John E. Donovan, Port Richmond, S. I., A, \$20.89 per ton, and 3 1/2 cts. per lb. for valves and specials; B, \$5.33 per ft.; C, \$1.19 1/2 per ft.; John Quinlan, of South Amboy, C, \$1.24 per ft.; Monmouth Contracting Co., Red Bank, A, \$20.60 per ton, 3 cts. per lb. for specials; B, \$5.98 per ft.; C, \$1.82; Liddle & Pfeiffer, A, \$20.50, and 2 1/2 cts.; B, \$5.29; C, \$1.34; George Gundrum, South Amboy, B, \$5.77; C, \$1.45; A. H. Crowell, Perth Amboy, C, \$1.40; O'Garra & Maguire, Newark, A, \$21.3 cts.; B, \$5.22; C, \$1.17; Ira R. Crouse, Perth Amboy, B, \$5.09; U. S. Cast Iron & Foundry Co., New York, A, \$19.24, 2 1/2 cts.; R. D. Wood & Co., A, \$18.74, 2 1/2 cts.; Standard Cast Iron Pipe & Foundry Co., New York, A, \$19.60, 2 1/2 cts.; Donaldson Iron Co., A, \$21.20, 2 1/2 cts.

Red Bank, N. J.—Water mains have been ordered laid on Bergen Pl. from Hudson Ave. to Broad St. and on Bridge Ave. from Catherine to Beech.

Brooklyn, N. Y.—Ordinance has been signed appropriating \$1,722,600 to develop Brooklyn's sources of water supply on Long Island, as well as extension of high-pressure system. The infiltration gallery system will be developed during 1914 at cost of \$1,300,000. High pressure pumping station will be constructed at Massapequa gallery at cost of \$25,000; new trunk mains in East New York and Bedford district at cost of \$150,000; small distributing mains in every direction at cost of \$250,000; new pumping engine at Mount Prospect station, cost \$17,600, and additional hydrants, cost \$30,000.

Hudson, N. Y.—Plans and specifications for proposed new reservoir at Meltingah, are now on file with Commissioner of Accounts at Beacon and availability of submitting to taxpayers proposition calling for expenditure of approximately \$200,000 is being discussed by Commissioners. Dam would compound about 75,000,000 gallons of water as against 145,000,000 gallons now compounded at Beacon. Estimated cost of dam exclusive of engineering expenses and purchase of 26 acres of land amounts to \$170,000. Total would undoubtedly be about \$200,000.

Oswego, N. Y.—Finance Committee has recommended granting of \$5,000 to Water Department for extension of mains and it was so ordered.

Rochester, N. Y.—Secretary Frank X. Pifer has been directed to advertise for bids on 50 tons of lead for Water Works Department.

Rochester, N. Y.—Issue of \$100,000 in water works improvements notes has been authorized. Commissioners of Sea Breeze water district have been authorized to lay 6-in. water pipe in Woodman Rd. from Ridge Rd. to Durand-Eastman Park, provided that bond be given for \$10,000 to protect city from loss through any accident during construction or maintenance.

East Allentown, Pa.—The Bethlehem City Water Company has sold its water plant in East Allentown to city for \$21,000.

Newville, Pa.—Citizens have voted on proposition to issue \$14,000 in bonds to be used in purchase of water works.

Pawtucket, R. I.—See "Streets and Roads."

Allendale, S. C.—Bids will be received by W. F. Googe, Chr. Bd. Public Works, until 12 o'clock noon, June 10, 1914, for \$65,000 5 per cent 40-year water, light and sewer bonds.

Huron, S. D.—Election will be held on June 23 for voting on question of issuing bonds in sum of \$22,000 for purpose of securing site, constructing, installing and equipping mechanical gravity filter plant and increasing water supply of said city, all as part of public water-works system of said city, for purpose of providing pure water for domestic uses. S. S. Oviatt is City Auditor.

Houston, Tex.—Mayor Campbell in annual message recommends construction of water storage tank.

Price, Utah.—Negotiations are now pending for new water system.

Snohomish, Wash.—Resolution of intention has been passed for improvement of city water system. General character of work will consist of excavating and laying 15,000 ft. of lin. pipe with necessary connections and repairs on reservoir. Approximate cost of proposed work as given in estimate of Engineer Colburn is \$19,060.

Tacoma, Wash.—Mayor Fawcett recommends chlorine gas plant at Green River watershed for purification purposes. Appropriation of \$10,000 has been allowed for purification plant.

Casper, Wyo.—Voting at special bond election, Casper electors have authorized issuance of \$75,000 of bonds for increasing city's water supply and \$15,000 of bonds for extension of sewer system.

CONTRACTS AWARDED.

Esecondido, Cal.—Lowest bidder for installing water works plant is J. M. Gardiner Co., of Los Angeles, at \$70,000 for reservoir pipe lines and pumping plant.

San Francisco, Cal.—For boring well for municipal water works, at county line, to W. H. Haley, at \$1,260.

Joliet, Ill.—By Board of Local Improvements, by construction of water main on Summit Line St., to Robert Shannon, at following bid: 1,240 ft.; price per lin. ft. for all material and construction of 6-in. cast iron water main casked and finished complete, 70 cts.; 1,650 ft., price per lin. ft. for excavation and backfilling trenches over water main, hydrant and service connections, 23 cts.; 20 lead service connections, 30.5 ft. long, with corporations and stop cocks connected to main, complete, price each, \$13; 19 lead service connections, 8.5 ft. long, with corporations and stop cocks connected to main, complete, price each, \$7.50; 2 6-in. gate valves, price each in place, complete, \$14; 1 6-in. hydrant, price each in place, complete, \$41; 39 Buffalo service boxes in place, complete, price each, \$1.20; 3 valve manholes, in place, complete, price each, \$23. Specials in place, complete: 1 connection to the Summit St. main, including valve, complete, in place, \$35; 1 6-in. sleeve, in place complete, \$3; 1 6-in. cross, in place complete, \$8; 2 6-in. T's in place, complete, price each, \$7; 2 6-in. plugs in place complete, \$1. He was also awarded contract for water main in Center St. A. M. Barry is Clerk.

Goodland, Kan.—For constructing water works to include about 36,000 ft. 4, 6 and 8-in. pipe to Gordon & Taylor Constr. Co., Denver, Colo., at \$24,210. Other bidders: J. S. Schwartz, Colorado Springs, \$24,220; T. C. Brooks & Sons, Kansas City, Mo., \$24,350; Peter O'Brien & Son, Denver, \$26,500. C. C. Calvert is City Engineer.

Holyoke, Mass.—John Fox & Co., of New York, was awarded contract for furnishing Water Department of city with approximately 91 tons of pipe in sizes of 4-in., 8-in., 10-in. and 12-in. Bid of that company was lowest, \$22 a ton.

Grand Rapids, Mich.—Board of Public Works has opened big bunch of bids, but none of jobs. Following was low bidder for water mains: Water mains in Rose, Lockwood and Briggs Sts., Hilding & Robie, \$517.98; water main in North St., Verhey & Kloote, \$643.94; water main in Houseman Ave., Hilding & Robie, \$680.40.

Dexter, Mo.—To Arrow Eng. Co., St. Louis, at \$23,882 for approximately 6 miles 4 to 8-in. c. i. water pipe, 34 hydrants, 24 valves with boxes, 70,000-gal. tower tank, and pumping station complete. Frank L. Wilcox is Engineer, Syndicate Trust Bldg., St. Louis.

Bayonne, N. J.—To Chas. T. Kavanagh, Bayonne, for construction of 4 water mains, at \$7,346.

Perth Amboy, N. J.—For installation and furnishing of standpipe to J. K. Petty & Co., of Philadelphia, at \$11,460.

Rahway, N. J.—At special meeting of Board of Water Commissioners contract for new low-lift pumps to be installed in connection with extensive improvements now being made has been awarded to the Wheeler Engineering & Condenser Co. for \$4,540. Nearest competitive bidder to this figure was American Well Works, whose bid was \$4,682. Pumps are to have a capacity of 3,000,000 gallons. They will be used for pumping water to new sedimentation tanks now being constructed, while big snow pump installed year ago will pump water from the sedimentation plant to big standpipe. All of present improvements are in line with plans formulated by Nicholas S. Hill, Jr., consulting engineer of board.

Altoona, Pa.—Bids have been opened at water bureau offices for construction of new distributing reservoir on Prospect Hill, by Director H. J. Comman, of Department of Parks and Public Property. Six bids were submitted, lowest being by D. C. Server, Inc., the New York firm that is now constructing the sewage disposal plant. Bids are as follows: D. C. Server, Inc., \$113,000; L. R. Matthews & Co., \$122,647; P. W. Finn, \$183,303; Duquesne Construction Co., \$117,800; J. S. Vipond, \$138,442.35; Nicola Building Co., of Pittsburgh, \$129,056. Bids are being tabulated and contract will be awarded at an early date.

LIGHTING AND POWER

Oakland, Cal.—Specifications for lighting fixtures for new city hall have been adopted by City Council and bids called for, to be opened June 3.

San Mateo, Cal.—Chamber of Commerce has launched scheme to have electrolights placed throughout business district. These ornamental lamp posts will be different from anything now in service. They will be made of stone and lights will be on beautifully designed top supported on four pillars.

Boulder, Col.—A \$500,000 gas plant to supply Boulder and all northern Colorado towns with gas for domestic purposes is promised this city if Town Council grants extension of franchise to Federal Gas Co. from 17 years to 25.

St. Petersburg, Fla.—Bonds in sum of \$148,000 have been voted for gas plant.

Sterling, Ill.—Bids are asked by Mayor A. J. Platt, on boulevard light system for city. About 82 posts, 8,600 ft. suburban cable, transformer, etc.

Bowling Green, Ky.—Joint committees, composed of Light and Market Committees of City Council and Board of Public Works have reported favorably to Council, recommending acceptance of bid of Kentucky Public Service Co. to furnish street lights for "Great White Way" for Bowling Green, saving city about \$1,000 annually. Old electric light plant needs new machinery, which would cost several thousand dollars.

Norwalk, O.—People of Norwalk will vote in special election on Monday, June 22, on question of issuing \$120,000 in bonds for erection of municipal lighting plant.

Waynesboro, Pa.—Installation of white way on Main St. is being considered.

Allendale, S. C.—See "Water Supply."

Sioux Falls, S. D.—That plans and specifications for new lighting system proposed throughout business district will go through immediately following favorable action of business men in signing petition now being circulated is certain.

Wessington, S. D.—Town Council has voted to install municipal street lighting system. System will be installed at once.

Houston, Tex.—Mayor Campbell in annual message recommends construction of municipal lighting plant, in case Houston Light & Power Co. refuses to make required reductions.

Edgar, Wis.—Common Council has passed ordinance which gives franchise and contract to Hartig Light & Power Co. for electric current for next 20 years.

Stratford, Ont.—Citizens have voted \$22,000 bonds for new ornamental lighting on two streets and for extensions and improvements to present street lighting system.

CONTRACTS AWARDED.

Rocky Mount, N. C.—With decision that gas plant for this city should be of water gas, low pressure type, which was in accord with recommendation of consulting and gas engineers of the city, there has been placed order for machinery for first municipal gas plant in the State. Bids to supply machinery were

opened by Board of Aldermen and contract won by Western Gas Construction Co., of Fort Wayne, Ind., at \$21,345.

Erie, Pa.—By Council, contract for laying of high tension conduits in State St. to Joseph McCormick & Brother, local contractors, at \$39,810.40. F. G. Diefendorf, of this city, submitted lowest bid, \$36,152.10, but planned to lay conduits of fibre construction.

Lebanon, Pa.—The electric lighting contract for five years awarded Edison Electric Co. has been signed by Mayor John P. Longenecker, Councilman E. U. Sowers, superintendent of accounts and finance, and City Clerk Dan Sharp.

FIRE EQUIPMENT

Madera, Cal.—Citizens will vote shortly on proposition to issue \$6,000 in bonds for purchase of motor combination chemical and hose wagon and other equipment.

Atlanta, Ga.—The East Atlanta Improvement Club has adopted resolutions urging general council to provide appropriation to build and equip fire station in that section of city.

Tifton, Ga.—Citizens have voted bond issue of \$7,000 for purchase of motor combination chemical and hose wagon, also for installation of alarm system.

Springfield, Ill.—The rehabilitation of present fire alarm system at cost of \$500 and installation of switchboard at police station connecting with all fire houses will probably be undertaken by City Commission immediately.

Waterloo, Ia.—Steps to motorize entire fire department are being made as rapidly as possible.

Patchogue, L. I.—Village Board of Trustees of Patchogue has closed contracts for one 40-h.p. motor fire truck for Patchogue Fire Department. Truck has chemical engine attachment. It is said to cost \$2,700. Euclid hose company will probably be given new apparatus. Contract was also closed for motor tractor for firemen.

Beverly, Mass.—City Council Public Service Committee has called for bids for supplying Fire Department with 1,000 ft. of hose. Bids close June 2, at 7 p.m.

Milford, Mass.—It is expected that bids for 1,500 ft. of new hose will shortly be called for.

Pittsfield, Mass.—Automatic fire alarm system is being favorably considered.

Erie, Pa.—Fire tug may be purchased for use along water front.

Asbury Park, N. J.—Mayor William H. Duval will recommend purchase of new automobile fire engine for Allenhurst Fire Co.

Paterson, N. J.—Extensive improvements and alterations to fire department, according to present programme, will be made as result of rigid inspection made. In addition to improvements in fire apparatus, it is likely that several additional pieces of apparatus will be motorized.

Paterson, N. J.—Following are recommendations made for improving fire department: Two additional first class pumping engines to replace obsolete apparatus now in service; entire motorization of the fire apparatus throughout the city; manual fire alarm system to replace present method now in use; installation of a department telephone system to increase efficiency; extend work of placing fire alarm wires in conduits; separate alarm circuits to be installed at once in connection with present system; new hook and ladder apparatus with tractor drive to be placed at central fire headquarters; Truck No. 3 now in service recommended to be replaced with tractor truck now at headquarters; Engine No. 10 to be replaced by a new steam pumping engine with motor drive; purchase of 5,000 ft. of new fire hose such as approved by the underwriters; Engine No. 7 to be replaced with first size steam pumping engine to be motor driven.

Binghamton, N. Y.—By majority of 379 votes taxpayers of Binghamton have decided to expend \$60,000 to improve fire department of that city.

Cohoes, N. Y.—Bond issue of \$20,000 is being considered for new apparatus. James S. Calkins is Mayor; T. C. Collins is Chief.

Steubenville, O.—The \$5,500 fire truck bonds of city of Steubenville have been awarded to Ohio National Bank of Columbus on bid of \$5,512.75.

Pinegrove, Pa.—Fire committee is in need of 500 ft. of hose.

Austin, Tex.—City has decided to purchase Seagraves hook and ladder truck, to cost \$7,300.